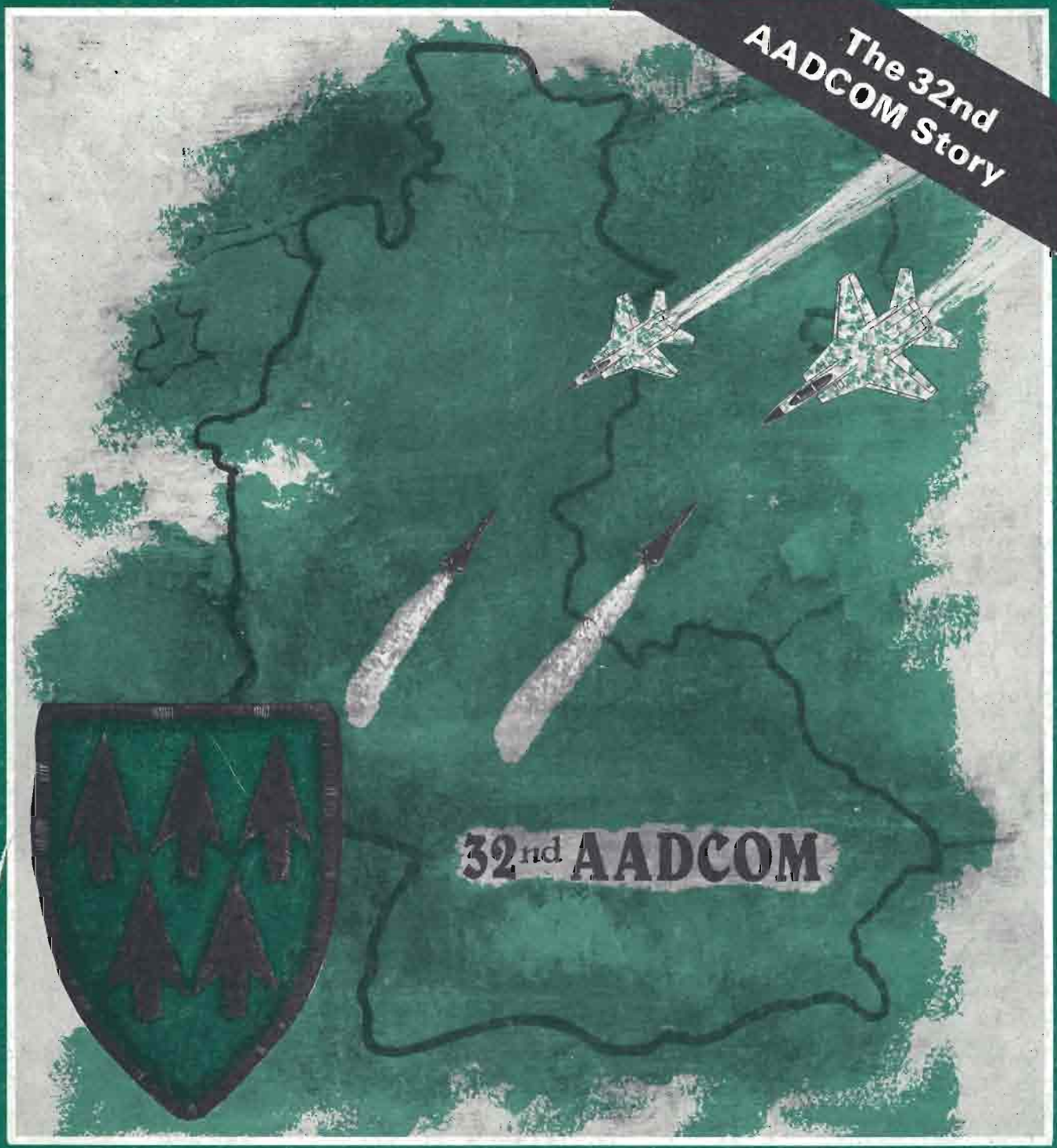
AIR DEFENSE ARTILLERY



SUMMER 1983

AIR DEFENSE ARTILLERY

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About the Cover

The cover illustration by SP4 Mark Yerrington, U.S. Army Air Defense Artillery School, depicts two Hawk missiles engaging MiG-29s against the backdrop of a map of West Germany. The artist's rendition symbolizes the role of the 32nd AADCOM in the defense of Europe, which is the subject of a special feature section in this issue of the magazine.

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DEPARTMENTS

This issue of Air Defense Artillery magazine features a special 15-page section on the 32nd Army Air Defense Command, compiled and edited by ADA magazine associate editor, Brian R. Kilgallen. 32nd AADCOM journalists highlight the mission and role of Air Defense Artillery in Germany, reveal what it is like to be an MP on a remote missile site and report on how the 3rd Ordnance Battalion's supply and maintenance procedures are making life easier for air defenders in Europe. Also featured in this section is an upbeat interview with MG William E. Cooper Jr., 32nd AADCOM commander. The section concludes with a focus on Crete, site of the NATO Missile Firing Installation, and a concise history of the 32nd AADCOM by Danny Johnson.

AIR DEFENSE ARTILLERY

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INTERCEPT POINT

. . .every war is rich in unique episodes. . . the element of chance is never absent. . . and we. . .need knowledge to react instinctively in times of danger, stress, confusion and friction on the battlefield.

—von Clausewitz

This issue of Air Defense Artillery magazine features a special section which focuses on 32nd AADCOM air defense artillerymen who face Threat forces across a few strands of barbed wire. Their enthusiasm for the anticipated fielding of Patriot and the SGT York Gun in Europe resounds throughout the section and their enthusiasm is justified. The technological excellence of our new and improved weapons will provide them an effective counter to the Threat's numerical advantage.

We must remember, however, that technology alone is not enough. An incompetent swordsman will dull even the finest blade. Tactical expertise, not technology, will separate winners from losers on the air-land battlefield. Victory depends on the sound tactical employment of our new weapons.

In the last "Intercept Point" column, I discussed the Army's new "Year of Excellence" theme and the obligation each of us who wears the uniform has to strive toward individual excellence. I would now like to expand the theme of excellence into the area of tactics.

There is an inseparable and mutually supportive relationship between doctrine and tactics. Doctrine consists of the fundamental principles which guide military forces in the pursuit of broad objectives. Tactics are the specific procedures and techniques smaller units use to win engagements and, by winning engagements, win battles.

Doctrine is the shielding of a national interest. Strategy is the defense of a continent or the struggle for dominance in a theater of operations. Tactics is the fight for the next ditch, the assault on the next hilltop, the conquest of the next town.

Americans were once considered masterful tacticians, but many historians contend we lost our taste for tactics on the bloody battlefields of Shiloh, Antietam and Gettysburg (where regimental casualty rates often exceeded 80 percent) and developed an

Major General James P. Maloney

excessive fondness for grand strategy. We won a reputation for logistical overkill, but lost a reputation for hard-nosed, small-unit tactics. It is time we regained a reputation for tactics. The realities of AirLand Battle Doctrine demand tactical excellence.

GEN Henry Knox, the Revolutionary War artillerist who wrestled his cannons overland from Fort Ticonderoga to take part in the siege of Boston, wrote: "Officers can never act with confidence until they are the masters of their profession." The same, I would add, is true of all ranks.

In the broadest sense, Knox meant total mastery of every aspect of our profession, but mastery of tactics is obviously a key ingredient of military self-confidence. The second of the Army's time-honored nine principles of leadership charges all leaders to be technically and tactically proficient. More failures of command and leadership are due to lack of know-how than to flaws in the characters of commanders. Leadership charisma is a wondrous attribute, but it is not an adequate combat substitute for knowing the right thing to do.

For air defense artillery soldiers, the process of learning tactics—of knowing the right thing to do—begins with institutional training at the U.S. Army Air Defense Artillery School. It never ends, except for soldiers destined to become as tactically obsolete as the guns and missiles on display at Fort Bliss' Air Defense Artillery Museum, for institutional training is only the foundation of tactical expertise.

Stay current. Outdated tactics are the wrong tactics. The fielding of new weapons has spawned a new outpouring of manuals and the advent of the AirLand Battle Doctrine has caused many of the older manuals to be revised. Read our new and revised how-to-fight manuals. Review the older ones. Study the air-land battle operational concepts contained in FM 100-5 and in the how-to-fight manuals of the combat maneuver units we will support in battle.

Field training exercises, joint training exercises, annual service practices and rotations through the National Training Center offer us a chance to practice what the how-to-fight manuals preach. Learn from these exercises. Tactical discussions at the platoon and squad level sharpen tactical expertise and lead to an appreciation of the importance of sound tactics in battle. But don't just talk to fellow air defense artillerymen. Talk to USAF fighter-bomber pilots. Ask them how they'd attack you. Talk to Special Forces troops about your ground security. Talk to Military Intelligence about intercepting your emissions.

Clausewitz proclaims: "Actual war is often far removed from the pure concept postulated by theory. . .war is the realm of chance and chance makes everything more uncertain. War is the domain of the unexpected. . .everything in war looks simple. . .in war the simplest thing is difficult."

Doctrine is sometimes rigid, but sound tactics are as fluid as the battlefield. Tactical expertise is knowing what to do when the unexpected, as well as the expected, occurs and nothing steels a soldier's nerve in combat as much as simply knowing what to do. Tactical expertise is military know-how at its most basic. No soldier who lacks tactical expertise merits the label professional.

My "intercept point" for this issue is that there is a right time and a wrong time to develop tactical expertise. The right time is now. The wrong time is after the next war begins. ✱

ON TRACK

Every soldier should know by now that the Army has declared 1983 the Year of Excellence. In one way or another, we all have heard or read about what the Army is doing to achieve that goal. This year, for instance, the Army introduced the new regimental system. Although it won't impact directly on the air defense community for some years, the system is designed to foster higher esprit and greater efficiency among soldiers in the combat arms. Increased emphasis is being given to the Army's "high-tech" division, the 9th Infantry at Fort Lewis, Wash., where new concepts in weapons and materiel developments are being tested under the most rigorous conditions. Highly sophisticated weapons, vehicles and equipment are being fielded as part of the force modernization program.

In our sphere of air defense, we have seen the fielding of Patriot, the Army's newest and most advanced surface-to-air missile system. The SGT York Gun is expected to roll off the production line later this year, and certain modifications are being developed to improve the venerable Hawk and Vulcan.

While all of these innovations are aimed at enhancing the Army's defense posture, I wonder how many of our soldiers have considered what they can do personally to contribute toward making this the Year of Excellence.

In a speech to the House Armed Services Committee earlier this year, GEN E.C. Meyer, former Army chief of staff, remarked that "our ability to deter wars in the future and our ability to win wars if deterrence fails will not be decided by how big our Army is—but by how good it is."

In my estimation, the quality of our Army is dependent on one major factor: People. We can equip our Army with the most technologically advanced weapons, provide it with the most up-to-date equipment and transport it in the latest vehicles; but, no matter how you look at it, the Army is only as good as the caliber of its soldiers. In other words, to achieve and maintain a high standard of superiority, we must first look at ourselves.

CSM Frederick T. Stafford Jr.

Fortunately, the quality of the average soldier in today's Army is becoming better than at any time in our history. In many ways, they are better trained, better educated and more physically fit than their predecessors. But that doesn't mean there isn't room for improvement.

I mentioned physical fitness, training and education; however, there is one quality that stands out among all the rest, and that is discipline. Discipline is the cornerstone upon which everything else rests, and military discipline, as we all know, is based on self-discipline.

A great British military leader and statesman once said that "discipline, at its best, is instilled and maintained by pride in oneself, in one's unit, in one's profession; only at its worst by a fear of punishment."

In a sense, self-discipline is perhaps one of the best ways an individual soldier can contribute to the excellence of the Army since it is, in essence, a quality-of-life issue.

Soldiers strive to improve themselves by taking advantage of the NCO Education System and applying for leadership courses and the basic and advanced NCO courses. During their off-duty time, they continue their civilian education, perhaps pursuing a college degree or learning a second language.

Good soldiers become better by keeping themselves physically fit—not because they have to, but because they want to. They are meticulous about their stamina, diet and health.

Model soldiers pride themselves on their appearances because they know their appearances not only reflect on themselves, but on the Army as well. Their brass is shined; their boots are polished; their uniforms are well cared for; their hair is neatly trimmed and well groomed. They walk tall and carry themselves with the bearing and dignity befitting soldiers in the U.S. Army. Equally important, they present themselves as well during their off-duty hours as they do on the job because they know that a good impression is instrumental in forming the public's opinion of the Army. Simply stated, unkempt soldiers suggest an undisciplined Army.

Our trainers can contribute to the Year of Excellence by producing soldiers who are proficient in their MOSs and basic skills. Special emphasis should be placed on marksmanship, land navigation, night and inclement weather operations, NBC defense and survival skills. It's up to you to see that your soldiers are trained to pass their physical readiness and skill qualifications tests with the highest possible scores.

In the last analysis, all our soldiers should strive to broaden their horizons, set new, attainable goals for themselves and take pride in their achievements. You are among the elite. Did you know, for instance, that only about 16 of every 62 males in the 17 to 21 age group are eligible to enlist in the Army under today's standards? That makes you special. That means you have what it takes to become a member of our team.

The Army needs men and women who are well trained, physically fit, motivated and willing to serve on a worldwide basis. We cannot afford to coddle shirkers, drug addicts, criminals and others who cannot meet the highest standards of a professional soldier.

Earlier this year, Secretary of the Army John O. Marsh Jr. sent a message to all Army personnel, a message that bears repeating. He said, "We should all be gratified by the progress the Army has made, through your efforts, in these past two years. I can state with confidence and pride, that we are an Army fully capable of accomplishing any mission assigned to it."

For all our country has given to us, it merits an Army of excellence. It is up to us to see that it has one. ✱

Letters to the Editor

Headquarters, 94th ADA Brigade, was delighted with the Winter 1983 issue of the magazine. The article ["The Longest Tour"] about the isolated site life of Battery C, 2nd Bn, 1st ADA, gave much needed recognition to our dedicated soldiers.

A former battery commander and assistant brigade S-3, MAJ Bill Knox, wrote an excellent article ["AirLand Battle 2000"] and SP5 Coffie ["Who's News"] was recognized for his accomplishments as an athlete and a new American.

However, as of Oct. 1, 1982, the 3rd Bn, 59th ADA, was reassigned from the 10th ADA Brigade and the 2nd Bn, 62nd ADA, was reassigned from the 108th ADA Brigade to become integral parts of the 94th Brigade team [Senior Commanders' listing].

Ricky Benito
CPT, ADA
94th ADA Brigade

The next Senior Commanders' listing will be published in the Winter 1984 issue of the magazine and will reflect all reorganizations.

I would like to take this opportunity to congratulate you on your new title and on the Winter 1983 issue. This issue is the best you have published.

There is an error in your identification of the 1st Bn, 3rd ADA, as a Vulcan battalion. We are currently a Vulcan/Redeye battalion and will soon be Vulcan/Stinger. Additionally, the 101st Airborne Division should be correctly titled the 101st Airborne Division (Air Assault). Being the only air assault division in the world, we Screaming Eagles are very proud of our correct title.

MAJ Knox's article, "AirLand Battle 2000: Air Defense," was very interesting and, at the same time, alarming to me as a soldier. The statement, "Although land battle commands have no organic air defense assets. . ." should not be the official position of Air Defense Artillery. For too many years, I have watched Air Defense Artillery being made to provide more and more of its extremely limited assets for theater, which really means Air Force defense, while our fellow soldiers are required to fight the critical corps and division part of the air-land battle with nowhere near adequate protection. If this concept is allowed to be established as doctrine in the resource-limited defense policy in which we will always find ourselves, there will be no air defense protection for the soldier with the gun who, in the end, must win the war.

V. J. Tedesco Jr.
LTC, ADA
1st Bn, 3rd ADA

MAJ Knox replies:

I fully appreciate your concern of inadequate air defense force structure to accomplish the mission. As the published Phase II concept was written, the land battle command was a small, highly mobile tactical headquarters element which would receive its air defense protection from colocating within a close combat force or from air-land air defense assets. The force structure to provide this air defense is to be designed in the air-land force air defense assets. The next phase of concept development (Phase III) is ongoing and the resolution of the role of the land battle command and its air defense is an issue for Phase III.

I was delighted to read "Ima Byrd's" article, "Oozlefinch Roosts at ADA Museum," in the Winter 1983 edition of the Air Defense Artillery magazine. I have known of that fearless bird all my life as my father was a Coast Artilleryman and retired as an air defender. As I was growing up, there was always an Oozlefinch roosting in the house. However, throughout our travels in the military, ours also suddenly disappeared. Then while stationed at Fort Sill, Okla., I had the occasion to visit Fort Bliss, Texas, in 1976 and one of my objectives was to obtain an Oozlefinch to replace our long lost bird. But, as stated by Ima Byrd, he had disappeared and none was to be had, not even in the school's bookstore. In fact, the sales clerk was not even sure what one was!

Finally, in April 1982, while visiting Fort Monroe, Va., I found him in all his splendor and glory in the Casemate Museum Gift Shop. Although in miniature (2-inches high), he once again has a roosting place centered in my wife's china closet.

Indeed, the Oozlefinch is alive and well! Thank you, "Ima Byrd."

Michael M. Irvine Jr.
LTC, ADA
Fort Dix, N.J.

This pertains to Patriot system schooling in MOSs 16T and 24T. Many soldiers want to know the following: How do I get into Patriot? Can I re-enlist for Patriot? Can I request the service school for 16T and 24T? When the Patriot battalion moves in (Germany), can I request to fill any vacant slots?

Now for my question. Where can an individual find out this information? It seems that career counselors are uncertain about the answers. Therefore, I ask for all those who are interested in knowing.

If you can provide the answers, please do so.

Luz E. Deramus
SGT, 6th Bn, 52nd ADA
APO N.Y. 09047

Your letter was forwarded to the Special Proponency Office, U.S. Army Air Defense Artillery School, for a formal reply. However, for anyone else who wants to know, here's what that office said:

There are no re-enlistment options currently available for any Patriot MOS. However, to be considered when future Patriot unit requirements are filled, a soldier must submit DA Form 4187 (Personnel Action) through command personnel channels to the ADA Career Branch at MILPERCEN.

All Patriot units will be deployed above 100 percent of their authorized personnel, thus precluding the need for additional personnel once they arrive overseas. Further, all ADA personnel will be required to receive formal training prior to award of any Patriot MOS.

One-Station Unit Training: Are Field Units Expecting Too Much?

by 1LT Margaret McLean

Responses from questionnaires sent to air defense artillery commanders in in the field last year revealed that some units were expecting too much from entry-level soldiers. Many officers presumed that newly arrived soldiers could step in and fill the shoes of, say, a recently departed, highly skilled technician. In other words, they thought they would be acquiring the skills of a journeyman when, in fact, the Army Air Defense Artillery School trains recruits only to the apprentice level. Nonetheless, field commanders continue to inquire about the training and quality of soldiers processed through one-station unit training at Fort Bliss, Texas. It is hoped that many of the questions will be answered here.

New soldiers spend 14 weeks in the 1st ADA Training Brigade at Fort Bliss. Divided into two phases, the first six weeks of training encompass basic skills common to all soldiers, such as drill and ceremonies, customs and courtesies, NBC training, first aid, guard duty and familiarization with the M-16A1 rifle. The last eight weeks are devoted to MOS training.

Because basic training subjects are fundamental skills every soldier must master, they are emphasized continuously during the 14-week cycle and reinforced at night and whenever the training schedule permits. These subjects make up the largest part of the comprehensive end-of-cycle test given to all trainees before graduation. If an individual does not pass the test, he does not graduate.

Throughout the process, the brigade stresses progressive development in order to produce a highly motivated, well-disciplined, physically fit and technically proficient soldier.

In concert with the Army's emphasis on fitness, recruits are scheduled for 50-minute physical training periods six days a week. Initially, they work out at an easy pace, then gradually build up

Soldiers from the 1st ADA Training Brigade get practical hands-on instruction on the M-42 "Duster." The brigade trains recruits only to the "apprentice" level.

to meet or, in most cases, to exceed the physical standards established by the Army. Before graduation, each battery is required to complete a five-mile run in 50 minutes or less.

It has been said that Fort Bliss conducts the toughest, most-rigorous field training of any Army training center in the United States. Unlike other training centers where recruits spend two to four days in the field, soldiers at the 1st ADA Training Brigade are sent to the desert for two weeks to master basic rifle marksmanship, weaponry, individual tactical training and practical NBC skills.

Field training culminates with a comprehensive tactical problem during which the battery occupies a night defensive position and moves to secure an objective early the following morning. By using ground aggressor forces, pyrotechnics and tear gas, realism is added to the scenario. It is here that the soldier gets his first taste of the combined arms team.

During the last eight weeks, the brigade offers instruction for 10 different MOSs. A soldier attends classes five days a week, returning to his battery at night. He remains with the battery just as he did in basic training for two reasons. First, the battery can reinforce the basic skills learned in the first phase of his training; second, the soldier has the advantage of support from a familiar group.

In addition to instruction in the technical MOS skills, the 1st ADA Training Brigade can, if necessary, provide a high school GED program. Developed as a means to eliminate training distractions faced by field commanders when non-high school graduates attend school during duty hours, the program begins in the reception station where all non-graduates are given the GED pretest to determine eligibility for the final test. Of the 616 soldiers (approximately 11 percent) tested in FY82, 487 passed their GED examinations. Today, however, the Army is not actively recruiting non-high school graduates because of the overabundance of highly qualified high school-diploma graduates wishing to enlist.

Perhaps the single most important point to be clarified with regard to one-station unit training is that a new soldier is trained to perform skill level 1 tasks. As stipulated in the trainer's guide, "he will not be proficient in all the tasks." To leave no doubt as to what field units should expect, the following was recently added: "The soldier is, in other words, an apprentice trained in selected critical tasks. It is the responsibility of commanders and subordinate trainers to develop the apprentice soldier into a fully trained soldier, utilizing the soldier's manual, this trainer's guide, the job book, SQT and ARTEP."

No soldier, after only 14 weeks of training, however intense it may be, can be expected to replace a highly skilled soldier with many months of experience.

A basic tool the 1st ADA Training

During their two weeks in the desert, trainees practice NBC skills in addition to individual tactical training and basic rifle marksmanship.

Trainees dig in during individual tactical training at Fort Bliss' McGregor Range.

Brigade uses to inform commanders about what a soldier has achieved during training is the Gaining Commander's Packet, which consists of the individual's training record, Army physical fitness evaluation scorecard, personal clothing record and the weapon and hand grenade scorecards. A response card is also included in the packet. This card allows the gaining commander to indicate whether or not the packet is complete and to make comments that will assist the brigade in training development. In essence, the Gaining Commander's Packet serves as a transcript of a soldier's skills and qualifications acquired during one-station unit training. Based on the information in the packet, the commander can determine where unit training should begin.

Initial-entry training is the first phase of the all-important military socialization process known as "soldierization," a process by which an individual's behavior becomes consistent with the standards, values and behavior of the Army. It is accomplished not only through formal instruction, but by observation of professional cadre during all phases of training.

Again, it should be emphasized that the one-station unit training soldier is still an apprentice. He has received limited, but intensive, training in certain skill level 1 qualification and familiarization tasks. The time between graduation from one-station unit training and the start of MOS-related training in the field must be kept to a minimum. Aggressive and immediate unit training upon the soldier's arrival is essential to cement in his mind those tasks already learned and to allow him to master necessary skills particular to the unit. It is up to the new commander to keep the level of proficiency high and his new soldier highly motivated.

Soldierization is the single most important factor in turning a civilian into a soldier and an initial-entry trainee into a competent, motivated member of a unit. If the process is to continue upon the soldier's arrival at his first unit, commanders must recognize its importance and set up realistic training programs to continue this all-important task of helping new soldiers become integrated into the Army. ✱

During the last eight weeks of one-station unit training, the 1st ADA Training Brigade offers instruction in 10 MOSs. However, the brigade trains only to apprentice level, which is to say skill level 1. The following MOSs are awarded at the U.S. Army Air Defense Artillery School at Fort Bliss.

- 16B (Nike Hercules Launcher Crewmember)
- 16C (Nike Hercules Fire Control Crewmember)
- 16D (Hawk Crewmember)
- 16E (Hawk Fire Control Crewmember)
- 16F (M-42 "Duster" Crewmember)
- 16H (ADA Operations and Intelligence Specialist)
- 16J (Defense Acquisition Radar Crewmember)
- 16P (Chaparral Crewmember)
- 16R (Vulcan Crewmember)
- 16S (Redeye/Stinger Gunner)

1LT McLEAN *is a battery commander with the 1st ADA Training Brigade at Fort Bliss, Texas. A native Texan, she received a bachelor's degree in sociology from Texas A&M University and a master's degree in human relations and administration of justice from Webster University. During the past two years, she has served as a training officer in one-station unit training and assistant adjutant for the 1st ADA Training Brigade.*

Students trained on the AN/TSQ-73 trainer have demonstrated a reduction in skill acquisition time and an improvement in skill performance.

Training Aids Close Technology Gap

by Shirlee Allen

The Army has never ignored technology when it comes to weapons or other combat developments, but sometimes we've been slow to apply new technology to training.

The U.S. Army Air Defense Artillery School, Fort Bliss, Texas, is committed to maximizing the combat effectiveness of air defense by closing the technology gap between its weapon systems and its training methods.

The successful engagement of hostile aircraft by the Army's air defense weapon systems requires innovative approaches to training. To manage the recent proliferation of high technology in military training, USAADASCH has organized an Instructional Technology and Simulation Division within the Directorate of Training Developments. The new division's mission is to develop cost-effective training devices which will permit equipment-intensive training for the soldiers who crew today's complex and costly air defense weapon systems.

The high cost of new systems such as Patriot and the SGT York Gun has compounded the problem of acquiring sufficient end items to train students on the actual equipment. Limited access to equipment for hands-on training and the resulting increase in damage to these costly systems have forced USAADASCH to turn to high-tech training devices and simulators. Six of these devices are currently being used or evaluated at Fort Bliss.

OTT

The Patriot operator tactics trainer has been in use since July 1981. The OTT uses a PDP 1170 Computer and can simultaneously train eight students in Patriot tactical engagements without dedicating tactical systems in support of training.

The OTT hardware is configured to simulate the operating positions within the Patriot's engagement control station and information and coordination central. Air battle scenarios for the OTT are developed by Fort Bliss using a VT 100 terminal and a TALOS digitizer. These scenarios, when displayed on the OTT scopes, provide realistic training for operators and commanders.

AMTS

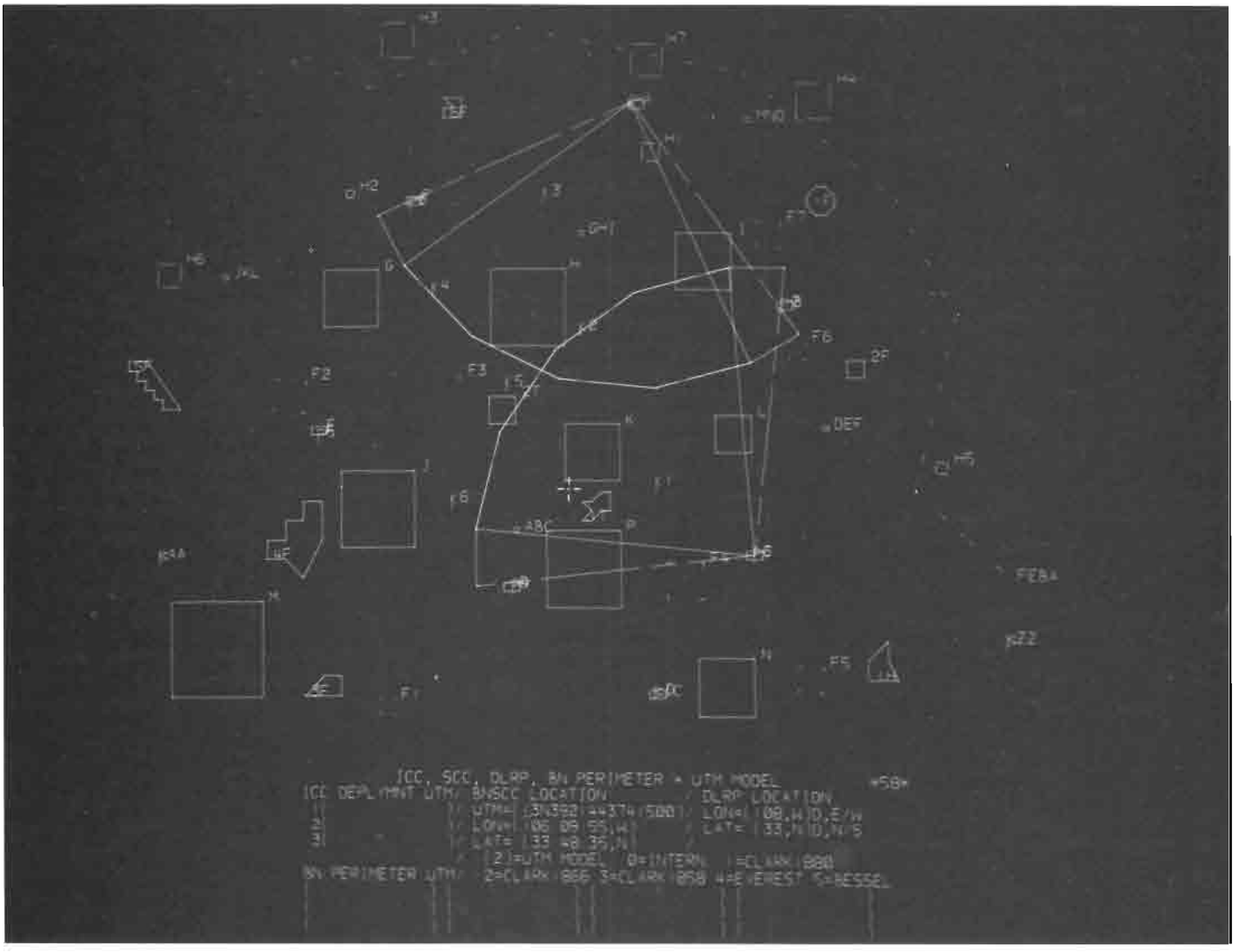
The active maintenance training simulator, a sub-component of the Patriot organizational maintenance trainer is now being used to train Patriot maintenance crews. The AMTS consists of two life-size, split shelters and replicates the Patriot radar set and engagement control station. The shelters contain subsystem hardware simulators, an instructor station and six "reader-doer" stations, all of which are computer driven for high, through-put, efficient team processing.

The AMTS is designed to develop a high level of proficiency in manual and display-aided maintenance procedures. The AMTS stations display the procedures on terminal screens and cue operator/maintainer trainees (readers) who then direct other trainees (doers) to fault locate, remove and replace, repair, test, inspect, adjust, align and calibrate various items on the radar set and engagement control station.

A hard-copy printout tells the operator precisely what equipment will be required and which MOS skill will be needed to complete the task.

SITS

The student interactive training system has been developed by Fort Bliss as a generic, two-dimensional equipment simulator. The SITS uses video discs along with a touch-sensitive screen to simulate actual equipment functions and malfunctions. Basic, as well as complex, skills can be taught on SITS. Student skills are developed and reinforced in a self-paced program from



Battalion assets as they appear on the display screen of a Patriot operator tactics trainer.

lesson plans that are designed, validated and implemented by Fort Bliss personnel.

After program validation, the SITS will be placed in training programs at Fort Bliss to rehearse students on equipment procedures, thus maximizing the effectiveness of actual system time.

AMTESS

The army maintenance training and evaluation simulation system, a microcomputer-driven, three dimensional, high-fidelity simulator, is being developed for the Hawk high-powered illuminator radar. Evaluations of the Bartek/Seville and Grumman AMTESS concepts have been completed at Fort Bliss. Both systems were subjected to extensive student evaluations.

Designed to facilitate entry-level training as well as to sustain and evaluate skill levels in operational units, the AMTESS program is supported by Project Manager, Training Devices, Orlando, Fla., as a research model for the future procurement of maintenance trainers.

DIS

The distributed instructional system is a computer-assisted, computer-managed instruction lesson and computer-simulation program for the Hawk missile system.

The DIS uses microcomputer and video disc technology to simulate system functions to operators and maintenance personnel. Student evaluations for the program have been completed and field validations for extension courseware are being scheduled.

NIDA Trainer

The NIDA trainer is a small, low-cost, efficient and flexible, electronic digital technology trainer. Built by NIDA Corp., the trainer is self-contained with three built-in, adjustable, DC power supplies, voltage and current meters and AC voltage selection.

Plug-in printed circuit cards feature switches, adjustments, test points and lamps to provide realistic operational set-up and troubleshooting analyses. The trainer will accommodate one to three circuit cards. Each card position has 10 fault switches which are used to insert circuit card malfunctions. This is usually done by the student during training and by the instructor during testing.

The NIDA trainer is adaptable to self-paced or conventional instruction and may be used for both institutional and extension training.

As a next generation replacement for the NIDA trainer, Fort Bliss is currently developing the basic electronics

and advanced digital simulation system. BEADS will train, test, evaluate, manage and control students through the training modules by mathematically modeling electronic components and circuits. Neither the hardware nor the software needed to implement the BEADS system has been identified.

16H Computer-Assisted Instruction

In June 1982, USAADASCH implemented its newest computer-assisted course of instruction. Designed to relieve the over-burdened AN/TSQ-73 command and control system trainer—which was on a 24-hour, five-day schedule—the Missile Minder trainer was developed with TRADOC assistance from the Training Development Institute and the Army Communicative Technology Office.

The MMT microcomputers now exercise students on various system functions. Labs are used only to confirm skill proficiency, thus eliminating the need to procure additional multimillion dollar end items. These Apple II microcomputers are being used to present AN/TSQ-73 Missile Minder system functions to 16H one-station unit training students.

The effectiveness of the program was evaluated under the TRADOC Scientific Services Program. The evaluation was performed by the Battelle Columbus Laboratories, which concluded that the use of computer-assisted instruction is an efficient, effective training medium. Data collected indicated highly positive student and instructor acceptance, a reduction in skill acquisition time and an improvement in skill performance.

Other high-tech training devices and simulators are in various stages of development.

MERIT

The military equipment recognition and identification training system is in the planning stages. MERIT will use microcomputers and video disc technologies to address the major air defense training requirement of aircraft recognition for SHORAD systems. Aircraft recognition is a training task requiring continual refresher training and a great deal of repetitive drilling by air defense gunners. The MERIT is perfectly suited for coaching students to higher levels of proficiency.

MERIT has the added potential of providing a wide range of military equipment recognition training and will standardize ground vehicle identification techniques. It will support training for Chaparral, Vulcan, Stinger, the SGT York Gun and Roland air defense systems.

SHORAD Gunnery Simulator

Another project in the planning stage is the SHORAD gunnery simulator which will use video graphics to provide the gunner with an opportunity to practice target acquisition and engagement procedures and see immediate results. This type of training and resulting proficiency of the gunner translate into effective air defense on the battlefield.

Automated ISD

The Directorate of Training Developments has initiated actions to automate the Instructional Systems Development process.

The ISD model, through its five phases of analysis, design, development, implementation and evaluation provides a comprehensive plan for the ultimate training and evaluation of today's air defense soldier.

Accomplishing the directorate's training mission—the development and implementation of 76 Air Defense Artillery courses—requires the production of more than one million pages, including soldier's manuals, programs of instruction, trainer's guides, field manuals, tech lessons, graphic training aids, TV and motion picture programs and correspondence programs. These documents, in the past, were produced by the stubby pencil, yellow pad technique, an archaic and redundant method of converting words into type that makes training publications difficult to field in a timely manner.

The implementation of the automated ISD process, with its use of computer terminals and access to Fort Bliss' Automation Management Office's central computer, will reduce both the time and the cost of producing ISD publications.

Other High-Tech Projects

Thirteen additional computer simulation trainers are in the conceptual or developmental stages at USAADASCH. They are:

- Air Defense tactical system simulator
- Air battle management training system
- FAAR PPI simulator
- Maintenance institutional trainer
- Roland institutional trainer
- Roland field proficiency training equipment.
- SGT York Gun classroom trainer
- System maintenance trainer
- Realistic air defense evaluation system
- Integral operator trainer
- Tracking adjunct system trainer
- Patriot organizational maintenance trainer
- Improved Hawk fire distribution simulator trainer system

The fielding of new, highly sophisticated air defense systems has made Air Defense Artillery the Army's high-tech branch. Automated and computer-assisted training devices and simulators currently in operation or under development at USAADASCH will exploit recent breakthroughs in microcomputer and video disc techniques to match our high-tech weapons with high-tech training. ✱

SHIRLEE ALLEN, *a script writer with Audio Visual Section, Directorate of Training Developments, USAADASCH, Fort Bliss, Texas, has attended St. Petersburg Junior College, St. Petersburg, Fla., and El Paso Community College, El Paso, Texas. She currently attends the University of Texas at El Paso.*

HISTORY OF ADA

DURING WWI THE FLYING MACHINE WAS ENGAGED BY ALL AVAILABLE WEAPONS ON THE FIELD OF BATTLE. DURING THIS PERIOD "NECESSITY" WAS NOT NECESSARILY THE "MOTHER OF INVENTION."

"THEY'RE THROWING EVERYTHING AT US BUT THE KITCHEN SINK!"

Decoy System Resists Arctic Weather

by Paul Powell Jr.

It's usually about 12 degrees when SFC Jim Brassell, SSG Robert Bagley and SSG Kevin Eldridge go to work. The three are assigned to the Beales Test Support Complex at the U.S. Army Cold Regions Test Center, Fort Greely, Alaska. They are the crew that is testing two inflatable Hawk decoys in an arctic environment. Their daily job is to set up and inflate the "rubber duck" they are testing for the Army.

The Hawk decoy is a balloon-like facsimile of the Improved Hawk missile system. It is the same size and gives off a signature similar to the real thing.

Although the complete Hawk decoy system has nine configurations, the center is testing only two of them—the launcher and the improved continuous wave acquisition radar.

The inflatable Hawk decoy is being tested at the Army's Cold Regions Test Center, Fort Greely, Alaska, to determine its durability in subzero temperatures.

The three men are tasked with evaluating how well the decoys perform in cold weather, and how soldiers will perform when setting the system up and taking it down under arctic conditions.

The decoys are constructed from nonporous fabric consisting of a pliable mesh coated on both sides with a flexible plastic coating. Several individual pneumatic chambers are interconnected by air ducts. Equipped with airtight and watertight zippers designed to provide rapid deflation and additional air bleeding when being folded, each decoy contains one electrical blower with a pressure regulator and pop-off valve. They also have electrical heating panels designed to generate thermal patterns which cannot be distinguished by infrared sensors from the thermal patterns generated by genuine Hawk equipment.

Brassell, senior project NCO, said his team had to perform 20 24-hour emplacements. "We've accomplished that mission and are now conducting a seven-day constant-test operation," he said. Both tests are designed to evaluate the system's operational ability during continuous exposure to the elements.

Anchoring the decoys to the tough arctic ground was a challenge for the team.

"We use an arctic stake to hold it in place," test NCO Bagley said. "Once the top layer of ice is broken, it goes in pretty easily." But sometimes, the stake does not hold well. "I was hit by a pin flying out of the hole during one of the first emplacements," Bagley explained.

Although temperatures usually vary from 12 to 20 degrees during emplacements and take downs, the system has been tested at minus 20 degrees. The winds are the only factor that will stop the testing.

"We do have wind stipulations on the testing that require us to stop a test for anything over 30 knots, with gusts up to 40 knots," test NCO Eldridge said.

Cold temperatures and winds are the reasons for the selection of Fort Greely for the tests. "We have to know just how many emplacements we can get out of the decoys. We are testing the equipment for its reliability and flexibility in the cold and wind, and how well it will stand up," Bagley said. "Our best results so far have been with the launcher, but our final report will give a good description of both decoys."

Brassell said the system is a good one, and if the operating personnel take care of it, it will last a long time. "If you have a good NCO in charge of insuring proper transportation and unpacking, I believe it will be a good system," Brassell said.

Once fielded, it will take a crew about a week to become proficient with the system, according to Brassell. "Once you get the hang of it, it's easy to set up. I think I could put it up by myself in about 20 minutes, if I had to," he said, adding that a good crew could get the system working in about nine minutes.

Testing of the Hawk decoy system is being conducted for its developer, the U.S. Army Mobility Research and Development Command. The Cold Regions Test Center, under the U.S. Army Test and Evaluation Command, is a permanent test center designed to evaluate the effectiveness of Army materiel and its interrelationship with the soldier in cold climates. ✱

PAUL POWELL JR. *has been a public affairs specialist at the U.S. Army Test and Evaluation Command, Aberdeen Proving Ground, Md., since October 1982. He has been with the U.S. Army Materiel Development and Readiness Command for five years.*

Army Going to Regimental System

by Edward Starnes

To be a good soldier, a man must have discipline, self-respect, pride in his unit and his country, a high sense of duty and obligation to his comrades and to his superiors and self-confidence born of demonstrated ability.

—GEN George S. Patton Jr.

In March 1981, Army Chief of Staff GEN Edward C. Meyer decided that combat effectiveness could be improved by adopting a system to replace entire units overseas rather than by relying on individual replacements.

At Meyer's direction, several study groups met to determine what could be done to improve unit cohesion. Among the many recommendations was a regimental system that would have soldiers maintain affiliation with the first unit of their assignment and return to that unit several times during their careers.

Following a review of the studies, the chief of staff approved the formation of a new manning system—an American-style regimental system. As opposed to the British regimental system, the U.S. Army Regimental System is not a tactical regiment. Basically, the "regiment" consists of four battalions—two in the United States and two overseas. The new system initially will affect only the combat arms, but their service and support units could conceivably be brought into the system later.

The first two regiments were constituted from redesignated battalions, the 327th Infantry (Fort Campbell, Ky., and Alaska), effective Jan. 6, and the 23rd Infantry (Fort Lewis, Wash., and Korea), effective Jan. 21.

ADA Regimental System

The initial plans call for regimental programs within only Infantry, Armor, Field Artillery and Air Defense Artillery. Currently, the Army chief of staff has authorized the formation of 16 regiments, none of which are ADA. However, the ADA regimental system is expected to be fully operational in the 1986-90 time frame.

Air Defense Artillery will have six TOE regiments and six regiments in the training base. The six TOE regiments will be the 1st, 2nd, 3rd, 4th, 5th and 62nd. The six training base regiments will be the 6th, 7th, 43rd, 52nd, 65th and 66th.

The Specialty Proponency Office, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, has been assigned proponency for the ADA regimental program. According to officials of that office, the regimental designations were selected from a list provided by the Army's Department of Heraldry.

Why a Regimental System?

Lessons learned since World War II, and most recently in Vietnam, have caused the Army to rethink the personnel replacement system. During World War II, the majority of the combat arms soldiers stayed with the same unit for the duration of the war. Except for a few exceptions, the personnel system since has been based on individual rotations and reassignments. During the Korean War, a point system was established to determine individual rotation. In Vietnam, the rotation was based on a one-year tour. Many soldiers and commanders complained that they were being moved out of Vietnam just as they had adapted to their unit and combat operations. The continual influx of "green" soldiers and egress of combat veterans often hampered combat efficiency.

Army officials also point out that unit identity and pride play a large role

in the success of a unit. "American military historian S.L.A. Marshall discovered in his studies of small unit actions in World War II, Korea and Vietnam that, while it is a cause that gets a man to the battlefield, it is the responsibility and sense of belonging to a group that keep units together under fire and enable them to stick to the mission," explains WO4 Gerald Bird of the ADA Specialty Proponency Office. "In peacetime, this feeling of belonging translates into esprit and efficiency."

The mission of the Army is to deter war. To do so, it must convert its recruited individuals into combat effective groups. "The method by which the Army distributes personnel," explains one Military Personnel Center official, "and the extent to which it fosters a sense of belonging, loyalty, pride, purpose and cohesion will determine the level of readiness attainable. The regimental system will contribute to the establishment of those attributes."

Three-Phased Approach

The first phase of the regimental system is the establishment of regiments as a method of distributing soldiers within a more narrow circle. These regimental designations, including those for ADA, have been selected based on input from combat arms specialists and personnel specialists, as well as on historical input from the Army's Center for Military History, to insure regimental traditions, integrity and honors are kept intact.

Regimental "adjutants" at the Military Personnel Center have been established to monitor and direct personnel management actions specifically for their regiments.

In the second phase, a "colonel of the regiment" will be appointed to act as a guardian of regimental traditions; to coordinate community relations activities; to host charities; and to control properties, museums, associations and memorials for the regiment.

The third phase will consist of more active involvement by regimental staffs to include decentralized control of personnel. The regimental staff would conceivably monitor a myriad of non-tactical activities to include the training, military qualification standards and career progression of the soldiers of the regiment. As one Army personnel official said, "A sense of ownership by the regiment and a sense of belonging by the soldiers will have been established."

ADA Unit Rotations

According to Department of the Army Circular 600-82-2, "The New Manning System; Unit Replacement/ Regimental System," dated Oct. 15, 1982, all regimental assignments will be based on the premise that all battalion-level assignments will be with an element of the regiment to which the soldier is affiliated. While soldiers may periodically be assigned to training base units, schools or headquarters units elsewhere, all "troop" assignments will be with the same regiments.

"Rotation will be affected by moving units rather than individuals," Bird explains. "The interim goal for ADA is rotation by fire units, then by batteries and, ultimately, by battalions."

Bird notes that ADA poses a unique problem in fully implementing the regimental rotation scheme. A space imbalance MOS condition exists in all ADA specialties because of the preponderance of ADA units being based overseas. Bird goes on to say that, in most instances, individuals, as opposed to units, will continue to be rotated between CONUS and OCONUS.

"An ADA regiment will be made up of a group of like battalions (probably four) divided between a U.S. home base and an oversea locality," Bird explains. "For example, two Hawk battalions at Fort Bliss, Texas, could be paired with two Hawk battalions in Germany." This means that at the end of a three-year rotation period, these battalions would be replaced by other complete battalions and returned to their home base in the United States. Patriot units will be the only exception to this deployment/rotation procedure. These units will not be replaced in OCONUS by either battery- or battalion-size units, but will continue to be manned by the individual replacement system.

Affiliation Procedures

The affiliation with a regiment will be conducted in two phases. During Phase I, the Military Personnel Center will affiliate combat arms soldiers assigned to the initially designated regiment on the effective date of the regiment. Their records will be annotated to show the regimental affiliation.

Once the composition and rotation patterns of the regiments are established, Phase II will go into effect. A combat arms soldier will be given the opportunity to complete a Regimental Preference Statement on which he will list his choice of regimental assignments by priority. At the same time, he can also list previous assignments and family considerations which will bear on his choice.

The Military Personnel Center will then make affiliation assignments based on the preference statements and the needs of the regiments. Once the regimental affiliation process has been established, all future assignments will be influenced by the affiliation.

Bird notes that, "Retention in the same regiment throughout an Army career may be difficult to achieve, especially in the case of officers and senior NCOs who are eligible for higher staff, schooling and nominative assignments. However," he continues, "when such officers and NCOs complete non-regimental assignments and return to a troop unit, they will be reassigned to their parent regiment. A soldier desiring to leave his regiment would be accommodated through normal transfer application procedures."

Regimental accoutrements will be authorized and will be worn by soldiers even when they are not actually performing a troop assignment with the regiment. A soldier's permanent regiment will be denoted by a crest above the name tag. Officers will also wear branch insignia with regimental numbers.

Good for Everyone

Based on study and past experience, the benefits of retention in a regiment which include decreased personnel turbulence far outweigh any possible disadvantages.

The regimental system will also make Army life somewhat better for military personnel with families. Army officials maintain that the families of soldiers assigned to units under the new manning system would benefit because the soldiers would have a better idea of where they would be stationed next. This knowledge would allow soldiers to establish ties and roots in local communities.

Simply stated, the system is geared to provide tightly knit units which have trained together, know each other's weaknesses and strengths and can operate effectively together in a battlefield environment. ✱

EDWARD STARNES *is deputy public affairs officer at the U.S. Army Air Defense Center, Fort Bliss, Texas, where he has worked since 1975.*

Soviet Equipment Training Challenges Instructors

by Claire B. Starnes

ADATS students learn how to read a scope of the SA-8 simulator on its duplicate operator console.

Isolated in the southwestern desert, the Army Development and Acquisition of Threat Simulators (ADATS) program site is deceptive to the eye. The seemingly quiet site, located near Fort Bliss, Texas, houses a flurry of activity where studying of and training on Soviet equipment are part of the daily routine. An extension of the Directorate of Combat Developments, U.S. Army Air Defense Artillery School, ADATS realistically replicates an air defense threat that the Army possibly would face in a real engagement.

ADATS soldiers operate the full gamut of Soviet air defense equipment, including command and control and communications jamming systems. The three officers, two warrant officers and approximately 130 enlisted personnel are expected to be thoroughly knowledgeable about the operation of equipment like the ZSU-23-4 and all facets of Soviet air defense doctrine. They must act and react like "Ivan" on the battlefield. Developing an effective training program for soldiers to operate such equipment is a challenge to the instructors.

"There is no MOS for this type of equipment, therefore, there are no training manuals," CPT James E. Forsyth, chief of plans and operations and training officer, said. "We have to develop our own teaching programs." The greatest challenge, however, is for the operator to maintain his proficiency in his MOS while working in a non-MOS series (Soviet equipment operator).

SA-7 simulator gunners track a target while standing on a specially ADATS-designed vehicle. The SA-7 missile system is similar to the Redeye.

The programs of instruction (POI) and operational readiness evaluations (ORE) must be developed and administered by ADATS personnel. Hugh Bell, training manager, heads a crew of three RCA contractor civilians whose main purpose is to train future threat simulator operators who will perform in troop exercises and weapon testing.

Training begins in a conventional classroom where the student receives a familiarization course, through slides and films, on the equipment he will operate. Since "how to" films of Soviet equipment do not exist in the Army's training film inventory, ADATS personnel must develop their own. They provide the script and actors while the Training and Audio Visual Support Center produces and edits the films. Once completed, the films become permanent property of ADATS and are stored in the on-site library.

The second phase, hands-on training, continues the familiarization process.

"We prefer hands-on training on the actual simulators," Bell explained. "But for some systems, like the XM42S (ZSU-23-4) and the XM08S (SA-8) which have expensive gear that can be easily damaged, we use consoles." The two

system consoles are made from off-the-shelf items and are replicas of the simulators used in the field.

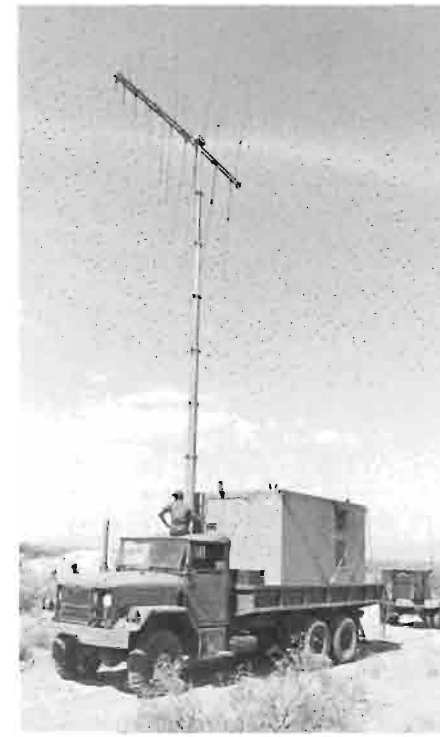
The simulators used by ADATS personnel are operational duplicates of the real Soviet systems. "The building of this equipment is based on the most recent intelligence data," Bell said. "We don't question the location of a switch even though it is awkward for the operator to use. We place it at the same location so that our operator must perform the exact same functions that his Soviet counterpart would."

Bell added that "If the Soviets use manual tuning, our operators must do the same, even though we can do it instantaneously using modern technology. What's important is that we maintain an exact reaction time—the same speed. If our troops are better than the Soviet troops, the test results will not be the same."

The third phase is the most important part of the training. During the crew drill, the student learns how to operate the actual system and its instrumentation—cameras and information packages. Once he has mastered those, he takes a qualification ORE. If the classroom and hands-on training were successful, and he passes the ORE, he can now operate the equipment in the field. Should the individual be weak in certain areas, he goes through the training phase again, but only in those areas.

"The classes are small and tailored to individual needs," Forsyth said. "If the individual passes the qualification ORE, he then moves on to Soviet tactics training where he learns how to operate in a Soviet environment."

What the individual learns is real. The training provided at the ADATS program site has been validated through an intelligence base that uses actual Soviet tactics. "We must do this to maintain our credibility," Bell said.



The R-330A communications jammer simulator can target air-to-air and air-to-ground nets in the VHF range.

ADATS personnel prepare a ZSU-23-4 simulator for shipment to a test site.

After two to three weeks of intensive training, the individual is then allowed to operate the equipment; however, he has not reached a state of independence. "It takes four to six months to really be prepared to act independently," Forsyth pointed out.

But training does not stop when the independence stage is reached. Once the individual has mastered one piece of equipment, he begins cross-training on another.

To help the students, the instructors are constantly on the lookout for training innovations.

"We like to play in the ADATS program," Bell said. "We're always looking for innovative approaches to training. For example, since today's soldier is so computer oriented, we have developed a computerized test. It's been extremely successful in that it gives the student immediate feedback," he explained. "This, we have learned, helps retention. The first time the students took the test, they did terribly. Most scored below 40. The second time was much better. Two weeks later, they retook the test. This time they passed with flying colors. The average score was 95 and motivation increased. In this game environment, they learn faster."

An SA-8 simulator leaves the ADATS maintenance shop and is now ready for field operation. The SA-8 is a mobile, command-guided missile system that has optical and radar target-tracking capability.

With no actual Army training program and no POI, Bell added that "we can be more flexible."

In addition, the ADATS instructors use every type of instructional aid possible. They have set up a library of 35mm slides and videotapes, all of which were taken by themselves or by students. These can be checked out at any time by students who want to continue training at their own pace.

"We also have videotaping capability out in the field," Bell explained. "The 39 gun and missile systems we have carry videotape recorders and TV monitors on board for immediate feedback, giving the operator the capability to correct his mistakes on the spot."

Immediately following an exercise, the crew sees itself performing on film. "Again, retention is quicker and they don't tend to repeat their mistakes," Bell said.

Mastering the operation of a ZSU-23-4 simulator takes four to six months of training. The ZSU-23-4 is a tracked, four-barrel, 23mm gun system that is radar and optically directed.

Hugh Bell, training manager, instructs ADATS students on the ZSU-23-4 operator console.

Tom Green, assistant instructor, prepares a remote-controlled helicopter as Elmer Collier, trainer, waits for flight time.

Another training innovation is the use of remote-controlled model aircraft that become targets for the systems to track. Built and flown by Tom Green, assistant training instructor, the model aircraft are seen on the radar as the real thing. "Not only are they cheaper to fly than real aircraft, but they are available when needed," Green said.

Once a soldier passes his tests and is considered capable of operating a system, he becomes part of a team that travels worldwide, creating threat scenarios for troop exercises and new-weapon testing for the Army and the Air Force. To add more realism to the scenarios, ADATS troop commander, CPT John Shropshire, is working to add platoon leaders to his unit's table of organization and equipment so as to resemble a true Soviet air defense battery.

The number of personnel that goes on an exercise or test depends on the equipment requested. Peculiar among requests is a monthly requirement to support the National Training Center at Fort Irwin, Calif., where ADATS provides the needed systems but supplies only one ADATS person who trains the NTC operators and oversees and monitors the equipment.

Recently, the crews have participated in Team Spirit '83 in Korea where six ADATS soldiers operated two communications jamming systems. ADATS personnel also participated in the Brim Frost exercise in Alaska. "We go anywhere," Forsythe said. ✱

SHORAD Surveillance System Survivability vs. Enemy Arm Strategies

by Frank W. Hopkins and Alan T. Johnson

The material presented is in parametric form. No performance assessment of any particular weapon system, either defensive or offensive, is intended. Analysts of particular systems may use their own performance data in studying effects of various situations if the notions discussed here apply. Examples will be given later to suggest possibilities.

If a surveillance radar can significantly enhance the effectiveness of short-range air defense against an enemy attack on our ground forces, or if the enemy thinks it can, then the enemy may choose to divert attack resources from his primary target and attack the surveillance radar with anti-radiation missiles (ARM) and thereby increase his chances of success in penetrating the short-range air defenses to reach his target.

If two radars in a netted surveillance system each have coverage over the enemy's intended approach path, then he must divert resources to attack both radars and suffer whatever attrition may be involved in such attacks. Similarly, additional radars with overlapping coverage impose an additional burden on the enemy.

At some point, the cost to the enemy in attacking the surveillance system exceeds the value of the benefit he hopes to receive. He may then decide to attack the primary target directly and suffer the attrition imposed by our unimpaired defenses, or he may decide to call off plans for attacking the target altogether.

Two notions that might provide insight into this aspect of defense are:

- the notion of a "force divider" as a measure of the effect of the defense on the number of sorties the enemy must mount to achieve a given objective.
- the notion of overlapping radars as a means of preserving defense effectiveness after an attack by anti-radiation missiles.

The "Force Divider"

Let us suppose that the enemy desires to destroy a target, say a convoy, with some desired probability of destruction, D_T, and let us also suppose that each aircraft in his raid has a probability of destroying the target of V_T. Then, in the absence of any defenses, he must send a raid of Y aircraft against the target such that $(1-D_T) = (1-V_T)^Y$.

A way of looking at the effect of the defenses is as a "force divider." As opposed to a "force multiplier," the defenses reduce the effectiveness of the offensive forces. To achieve the same probability of destroying the target, the offense must increase its sortie size. In effect, the offense must increase the sortie size in proportion to the force divider afforded by the introduction of the defenses.

In the absence of any defenses, the sortie size needed to achieve a desired probability of target destruction is given by

$$Y_o = \frac{\log (1-D_T)}{\log (1-V_T)}.$$

The result of the defense with effectiveness, P_K, is to reduce the offensive kill probability per sortie to $V_T(1-P_K)$. Therefore, when defenses are introduced, the necessary sortie size is

$$Y = \frac{\log (1-D_T)}{\log [1-V_T (1-P_K)]}.$$

The force divider is defined as the ratio of the sortie sizes

$$F_D = \frac{Y}{Y_o} = \frac{\log (1-V_T)}{\log [1-V_T (1-P_K)]}.$$

It is interesting to note that the force divider is independent of the desired destruction probability, D_T. It depends only on the offensive and defensive kill probabilities, V_T and P_K.

Figure 1 contains graphs of the force divider as a function of the defensive kill probability for two values of the offensive kill probability. A given defensive kill probability imposes a higher penalty, in terms of the force divider, on a more effective attacker.

A Short-Range Defense Scenario

Let us now suppose a short-range defense system between the target convoy and the enemy bases. The system will consist of several fire units exemplified by Chaparral and Stinger. Each

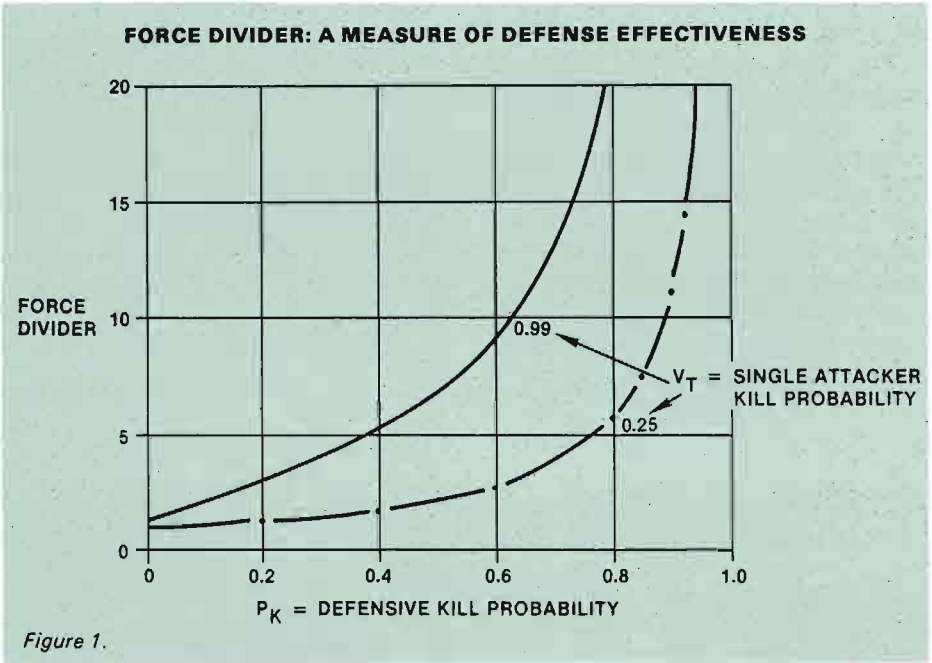


Figure 1.

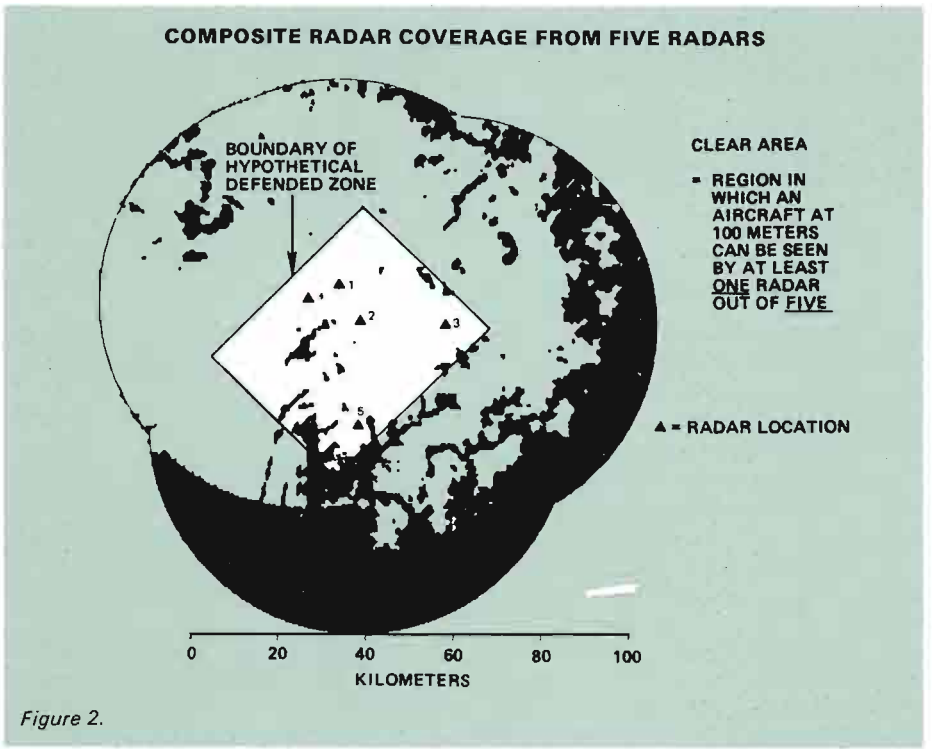


Figure 2.

of these fire units is capable of action whether or not they are supported by a separate radar system. The performance of these weapons for this scenario could be improved by radar detection of the enemy aircraft in advance and having the radar "cue" the fire units or tell the exact bearing of the enemy aircraft to the fire units. Each fire unit would then know where to conduct its own search for timely acquisition of the enemy aircraft. The effect of the radar is to increase the kill probability of the defenses from some level without cueing, P_{K_0}, to a higher level with cueing, P_{K_1}.

If the enemy were now to look at the force divider chart, which shows perhaps a significant increase in the number of sorties for a small increase in the effectiveness of the defenses, he might choose to attack the radar in the hope of driving the defense effectiveness from P_{K_1} back to P_{K_0} again. For illustration, if by sending a single ARM-equipped aircraft against the radar he had a likelihood of 1.0 of destroying the radar, and if

$P_{K_1} = 0.6$
$P_{K_0} = 0.3$
V_T = single aircraft probability of destroying the objective target = 0.25

then he can reduce the force divider from 2.7 to 1.5. If he needed four aircraft in the undefended case, for example, this strategy would reduce his required raid size from 11 aircraft to six—possibly a very worthwhile opportunity.

Effect of Radar Overlapping on Cueing Availability

Short-range air defense systems of the future will likely be supported by overlapping radars. There are several reasons for such radars, the reduction of terrain screening being especially important. Figure 2 shows a typical region for a hypothetical defended zone on which a penetrating aircraft is seen by at least one radar out of five. The radars are integrated in such a way so that as long as one of the radars sees the penetrating aircraft, cueing information can be supplied to the fire units.

An enemy planning to attack the convoy in our earlier example must choose a flight path through the defended region. Although at any instant there may be only one radar with coverage of the flight path, all radars may have potential coverage for its entire length. If the enemy wants to choose the strategy outlined earlier of reducing the force divider by attacking the radar system, he must now attack all five radars.

Let the probability that a single ARM-equipped enemy aircraft destroys a sensor it is attacking be V_R. Let D_R be the probability that a single radar will be put out of commission as a function of the single aircraft kill probability, V_R, and the number of attacking aircraft, n, against a single radar. Then, $D_R = 1 - (1-V_R)^n$, and the probability that at least one of, say, g sensors will survive such an attack by $n \cdot g$ aircraft is S such that

$$S = 1 - [1-(1-V_R)^n]^g.$$

This is what we've been looking for, the likelihood that there will still be a sensor left after the hypothetical attack to provide some cueing to the fire units. S is shown in Figure 3 as a function of D_R, the probability that one radar is put

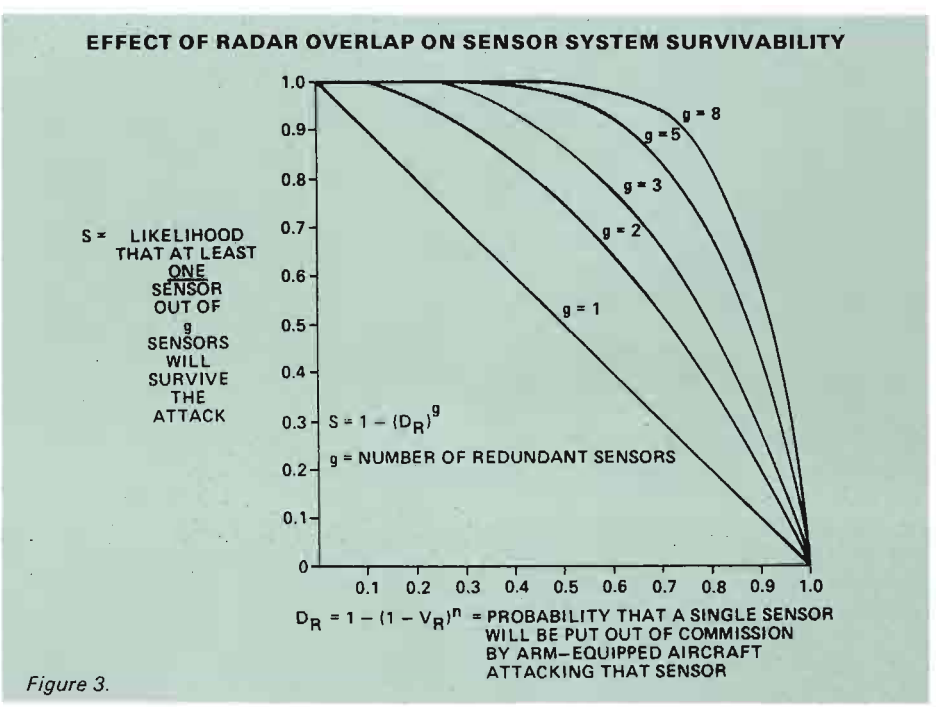


Figure 3.

out of commission by n aircraft, and the number of overlapping radars, g.

And after all that has taken place the effective kill probability of the resulting defense system in defending the assets it is supposed to protect is P_{K_r}, given that

P_{K_0} = Effective kill probability of the defense system against the enemy aircraft with *no* cueing and

P_{K_1} = Effective kill probability of the defense system against the enemy aircraft *with* cueing, then

$$P_{K_r} = \underbrace{P_{K_0}[1-(1V_R)^n]^g}_{1-S} + \underbrace{P_{K_1}\left\{1-[(1-V_R)^n]^g\right\}}_{S}$$

Let's look at a few examples. Let's assume the following:

P_{K_0}	(without cueing)	= 0.3
P_{K_1}	(with cueing)	= 0.6
V_R	(single aircraft kill probability against a single radar)	= 0.6
n	(number of aircraft against a single radar)	= 1.0
g	(number of radars)	= 8.0

Then,

P_{K_r} (resulting defense effectiveness) = 0.595

and,

Δ, the reduction in effectiveness from the baseline, 0.6. = 0.005

The effect is not noticeable on the force divider chart, Figure 1. From this analysis it would not pay the enemy to send eight aircraft on a radar-suppression mission in order to reach his objective target more easily. The defenses remain at their most effective.

Now, let's vary that example by assuming the enemy sends two aircraft against each radar. Then $P_{K_r} = 0.53$ and the reduction in effectiveness from the baseline = 0.07.

This is observable on the force divider chart and, for $V_T = 0.25$, reduces the force divider from 2.7 to 2.3. If his defense-free desired attack force had been four aircraft, this reduction would allow him to lower his raid size from 11 aircraft to nine aircraft. For example, by sending 16 aircraft to suppress the radars, he can reduce his primary attack force by two aircraft, though for immediate benefits this would not appear to be a good strategy. There may be future raids that would benefit, of course.

Inspection of the force divider curve, Figure 1, shows a fast rise as the defensive kill probability increases. If we run an example at higher assumed defense effectiveness points, the results change. But while a noticeable reduction in the force divider may occur, we also note that the enemy is operating at a severe disadvantage with respect to the defenses.

Conclusion

Other examples can be easily constructed. Increasing the number of radars further obviously increases, even more severely, the enemy's task in reducing the defense effectiveness. At some point it doesn't pay. Best of all, it may lead him not to attack the primary target after all.

This analysis has been constrained so far to radars in direct support of short-range air defense weapons and rests in large part on the fact that these weapons have a useful capability even if no cueing radars are available. The enemy's plans to take out the radars are based on his expectation of success and of the benefit of removing cueing. There are potentially many sources of cueing information available to the fire units other than radars in direct support. Radars from HIMAD, AWACS and other air defense systems may provide data to the fire units. There are many ideas presented for systems that are silent at the user end based on bistatic or multistatic radar techniques and passive systems. The integration of detection data from several sources, even though the accuracy and timeliness in the weapon system reference may be modest, necessarily compounds the enemy's problem in planning a radar-suppression strategy and reduces the confidence he can have that, by attacking the dedicated radars, he has eliminated cueing and reduced the defense effectiveness to its unaided level.

*

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Project Window: The First Air Defense Countermeasure

by Blair Case

The struggle between British night bombers and German night fighters took place amid exploding flak, searchlight beams and the glare of burning cities. It was one of the classic confrontations of World War II, a confrontation reminiscent of the clash between Spitfires and Messerschmitts or Grumman Hellcats and Mitsubishi Zeros.

The British switched to night bombing when daylight raids over Germany produced more casualties than RAF Bomber Command could stomach. "The Americans by day, the British by night," later became a cliche that described the deadly one-two punch of the combined Anglo-American bomber offensive. But, early in the war, German air defenders had only the British to cope with.

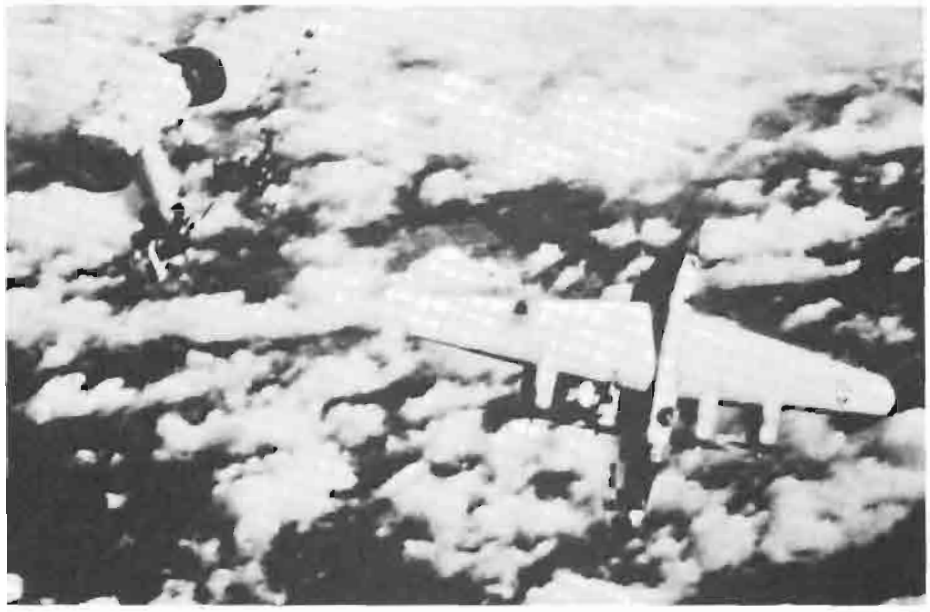
At first, the British Lancaster and Halifax bomber crews longed for clear skies, a star to steer by and a "bomber's moon" to illuminate their target. However, once Bomber Command perfected the use of radar beacons to guide aircraft at night to targets deep in Germany, the night bomber crews prayed for dark, overcast skies in which to hide from German night fighters and flak batteries.

The Germans, though, were quick to adapt radar to their own air defense, establishing a screen of early warning radars and equipping their night fighters and flak batteries with radar devices that robbed even the darkest night of its safety. Night bombing soon became almost as hazardous as daylight bombing.

Radar, one of the great technological breakthroughs of World War II, provided the edge that turned the tide of battle in favor of the RAF's outnumbered Spitfires during the Battle of Britain. It proved just as effective in German hands. Both sides were interested in developing a technological counter to radar. They discovered the solution was deceptively simple.

The Germans tested tin foil against radar for the first time in the winter of 1942 over the Baltic Sea. It was all very hush-hush. For Luftwaffe air controllers stationed at the scopes of their big Freya search radars and smaller Wuerzburg tracking radars, tracking the lone Luftwaffe aircraft boring in over the Baltic was not a challenging task. They were accustomed to tracking hundreds of RAF bombers simultaneously and the work at hand, by comparison, seemed like child's play.

Then, the unexpected happened. Crewmen aboard the Luftwaffe aircraft began kicking bundles of metal foil out of the aircraft's cargo bay. As the strips of metal foil fluttered like Christmas tinsel toward the cold sea, the radar scopes went berserk, exploding into hundreds of blips which seemed headed every possible direction at once.



"The Americans by day, the British by night." Around-the-clock bombing raids devastated Nazi war industries but the bomber crews paid a high price. An Eighth Air Force Liberator is cut in half by flak over Hamburg. (U.S. Air Force photo)

The test report ended up on Field Marshall Goering's desk. He was quick to grasp the implications. Germany's complex air defense system could be defeated by the simple dispersion of tiny strips of metal foil. Goering ordered the test report destroyed and the metal foil program abandoned. He wondered why the British, who had pioneered radar development, hadn't discovered this Achilles heel? What would happen when they did?

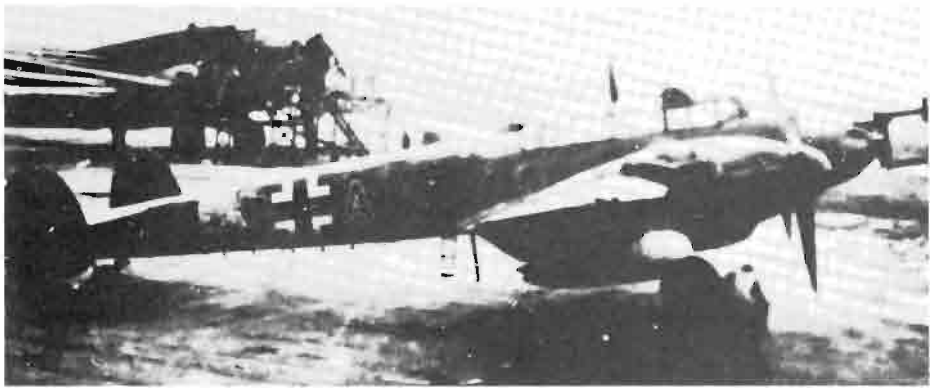
Actually, the British already knew about tin foil. They refrained from using foil to disrupt radar for the same reason the Germans refrained. Neither side wanted the other to know about tin foil's potential as a counter to radar until an antidote could be developed, and no antidote had been found. The British code-named their tin foil project "Window" and kept it strictly under wraps.

R.V. Jones, who headed Project Window and later authored *The Wizard War*, thought the ban on Window might have made sense during the blitz but, now that the tables were turned and British Chief Air Marshall "Bomber" Harris' bombers droned nightly over Germany, he thought the Luftwaffe's inability to retaliate made the ban ridiculous. He suspected the real reason behind the ban might be the War Ministry's reluctance to admit its wonder weapon could be foiled by something as simple as tin foil.

Project Window scientists theorized that strips of metal foil cut to a length corresponding to half the wavelengths of enemy radio frequencies would produce echos similar to aircraft on enemy radar scopes. The theory worked as well in practice as it did on paper. The idea was so simple that Jones was certain the Germans would figure it out for themselves eventually, if they hadn't already. Still, Whitehall refused to authorize the use of Window until early 1943 when German night fighters began inflicting increasingly heavy losses on British bombers.

German anti-aircraft fire during a night raid by the RAF bombers.

Artist John Paul Jones' illustration depicts a flak-damaged Lancaster bomber, the port engine afire, engaging a Ju-88 night fighter. The night fighters, their airborne intercept radars blinded by tin foil, resorted to attacking bombers silhouetted by the glare of burning German cities.



The Me-110 was converted to night fighting operations by the addition of airborne interception radar equipment. Note the radar antenna protruding from the nose. (U.S. Air Force photo)

The night fighters were Messerschmitt 110s and Junkers 88s. Designed as light-to-medium bombers, they were adapted to night fighting by the addition of airborne interception radars with a range of 1,400 to 4,000 yards. The night fighters were equipped with reflective sights and 20mm cannon and machine guns mounted at an angle to fire upward into the belly of a bomber. The Ju-88, one of the war's most versatile aircraft, was considered the deadlier of the two night fighters.

German air controllers scrambled the night fighters as soon as British bomber streams were detected over the North Sea. The night fighters concentrated near Germany's northern coast, flying circular zones that overlapped from the Baltic to Belgium while waiting for the bombers to make landfall. Wuerzburg radars, picking up the bombers as they entered German air space, fed air controllers the altitude, speed and directional data they needed to vector the night fighters into the bomber streams.

Night fighters could always tell when they entered the bomber stream because of air turbulence churned out by the prop wash of the big four-engine Lancasters and Halifaxes. Once inside the bomber stream, the night fighters simply narrowed the gap on the unseen bombers which they knew were somewhere out there in the darkness. A target would finally appear on the night fighter's airborne radar scope. The radio operator, in the back seat with the radar equipment, watched the ghostly blue image on the radar scope and guided the pilot to the target.

The crews of American B-17 Flying Fortresses, who shot their way to their targets—suffering tremendous casualties—during daytime, feared flak more than enemy fighters. They could at least see and engage the fighters. The night fighters, however, were the waking nightmares of British Lancaster and Halifax crews who bombed by night. The presence of night fighters in the bomber stream was announced only by the sudden explosion of bombers which lit up the night like star clusters.

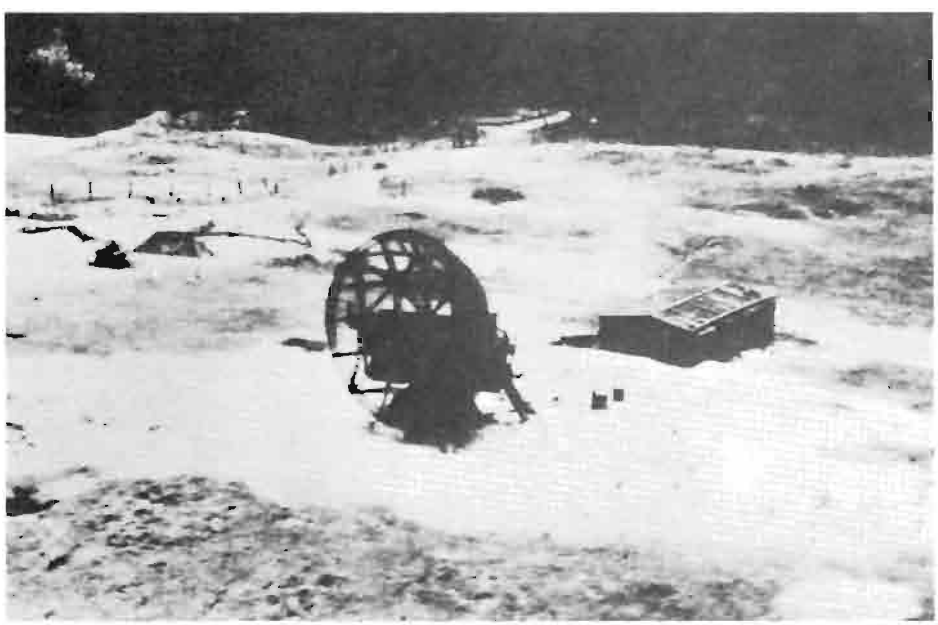
The night fighters, once in the bomber stream, harried the bombers all the way to the target and, once the bombers began their bomb runs, waited nearby to pounce like wolves on flak-damaged bombers winging for home. Night fighter effectiveness, which accounted for at least as many, and probably more, downed bombers than German flak batteries, was one of the reasons Churchill at last gave the order to "open the Window."

Bomber Command waited months to find a suitable target for Window's debut. The target selected was Hamburg and the operation was a series of massive raids that reduced the city to a funeral pyre and introduced the word "fire storm" to the English language.

The night of July 24, 1943, began routinely. The Freya radars stationed on the coast picked up the British bomber stream while it was still far out over the North Sea. Air controllers knew the spearhead of luminous pinpoints out ahead of the bomber stream were pathfinder bombers loaded with incendiaries to mark the night's target, but the bombers were still too far away for them to guess what the night's target would be. The air controllers scrambled the night fighters and waited for the Wuerzburg radars to make contact while the night fighters circled and the hundreds of luminous dots crept closer to the coast.

As the bomber stream approached Holland, the bombers began releasing tin foil at the rate of one bundle a minute, a tempo they would maintain until the bombers were well on their way home. The result was catastrophic. The Freya and Wuerzburg radar scopes became a blizzard of white dots. Air controllers sent night fighter squadrons on wild goose chases in search of phantom bombers while the 800 bombers in the British bomber stream droned on unscathed and undetected toward Hamburg.

Window was as effective against Hamburg's radar-directed flak guns as it was against the air defense warning radars. The flak batteries, firing blind



Wuerzburg air defense radars used to vector German night fighters into the bomber streams were blinded by Project Window. (U.S. Air Force photo)

without radar, were reduced to firing ineffectual box barrages, while directionless searchlights searched mostly in vain for the high-flying bombers. Hamburg quickly became an inferno. Some night fighters, attracted by the glow, finally found the bomber stream and attacked bombers silhouetted against the glare of the burning city. Still, of the 800 bombers dispatched on the first night of Operation Gomorrah, only 12 failed to return to their home bases.

Operation Gomorrah turned Hamburg into a giant incinerator and left 50,000 civilians dead. The Lancasters and Halifaxes dispatched by Bomber Command on the night of July 24 were followed by smaller daylight raids by Eighth Air Force Flying Fortressess on the 25th and 26th. The fires were still burning the night of July 27 when Bomber Command sent 787 bombers over the city. Their bomb loads combined high explosives with incendiaries which produced history's first man-made fire storm.

The conflagration at the heart of the city generated a tremendous vacuum. Winds exceeding 150 miles per hour howled through Hamburg, carrying building debris, uprooted trees and people into the flames. The city's cellars and bomb shelters, turned into crematoriums by heat in excess of 1,000 degrees centigrade, offered no refuge.

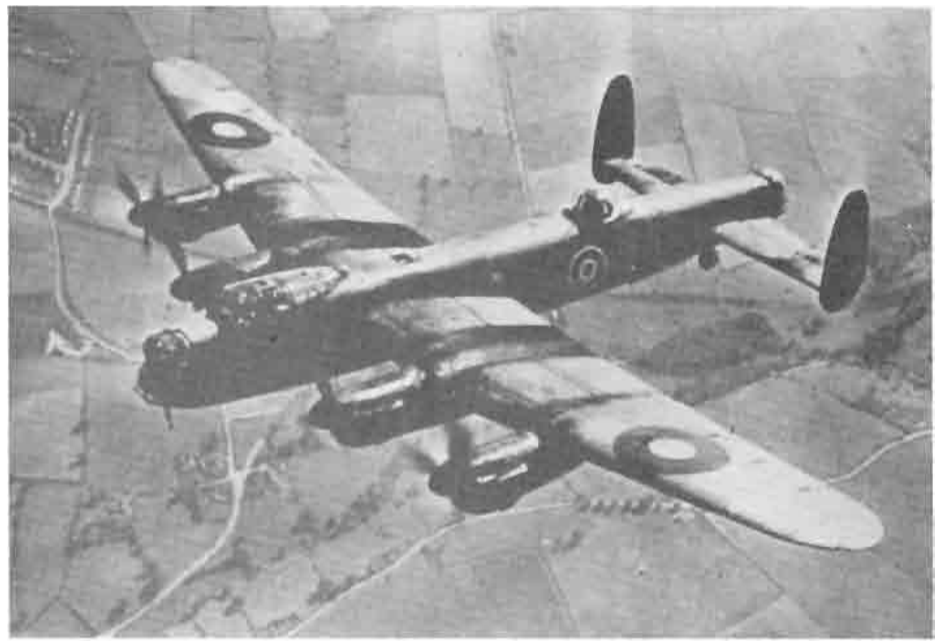
A German document described the fire storm: "In a built-up area, the suction could not follow its shortest course, but the overheated air stormed through the streets with immense force, taking along not only sparks but burning timber and roof beams, so spreading the fire more and more, developing in a short time into a fire typhoon as was never before witnessed, against which every human resistance was quite useless."

The combined British and American bomber force had killed—in one series of raids—almost as many civilians as had died during the entire Battle of Britain and, thanks to Project Window, they had done so at little cost to themselves.

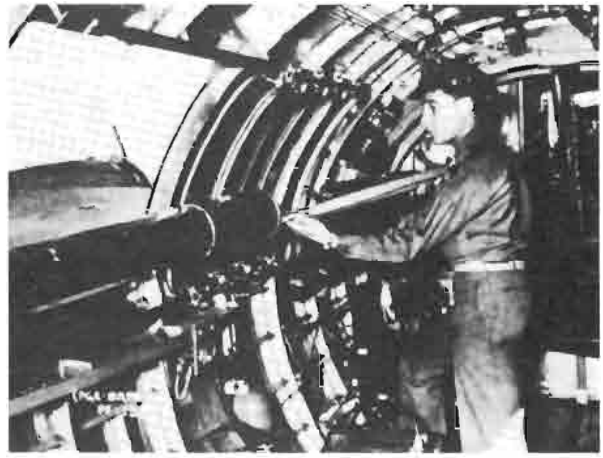
The initial German reaction to Window and to the death of 50,000 civilians in Hamburg during Operation Gomorrah was panic, but countercountermeasures were soon devised. The night fighters adopted "wild boar" tactics, ignoring their own flak and hurtling into the bomber streams directly over the target to catch Lancasters and Halifaxes caught in the glare of their own incendiaries. Radars and radio frequencies were modified to cut down on some of Window's effectiveness.

As the German air defense system began to adjust to Window, however, the American Eighth Air Force, having marshalled its great fleets of B-17 Flying Fortresses, began daylight precision bombing raids on German industry. Germany's fighter production capacity disappeared along with its ball-bearing factories, and the Luftwaffe was soon only able to put up token fighter resistance.

Project Window, meanwhile, demonstrated that complex technology can often be offset by simple countermeasures which require technology little more complex than that required to wrap a cold roast beef sandwich. ✱



The Arvo Lancaster was the mainstay of the RAF Bomber Command's offensive against German cities. (U.S. Air Force photo)



A U.S. B-17 crewman loads strips of tin foil into a launching tube. (U.S. Air Force photo)

Strips of metal foil were cut to lengths corresponding to half the wavelengths of enemy frequencies. When dropped from aircraft, the strips produced radar echos on enemy radar screens that simulated echos produced by bombers. (Photo courtesy of Imperial War Museum, London)

Getting Hawk Off The Ground

by SFC Teddy L. Silcox
and SGT Joseph Parks

Earlier this year, the skies over Fort Bragg, N.C., were filled with objects usually observed being towed down dusty roads. The Hawk missile system was undergoing tests for new, helicopter airlift rigging procedures. At the request of the Hawk Division, Directorate of Training Developments at the U.S. Army Air Defense Artillery School, Fort Bliss, Texas, the new procedures were recently validated by the Airborne Board from Fort Bragg. The results of those tests necessitated major revisions to the existing Hawk operator and organizational technical manuals.

The concept for helicopter movement of the Hawk missile system is not new. Because it is an ARTEP task, training extension courses were developed by a civilian contractor to instruct users in the preparation of Hawk equipment for travel by helicopter. The Army provided the contractor with technical manuals which contained the rigging procedures.

During development of lessons for the training extension courses, a major discrepancy was discovered by two subject matter experts from the school's Directorate of Training Developments. While taking photographs of equipment for the contractor to use to develop rigging procedures for the training extension courses, they found that the procedures contained in the technical manuals would be impossible to perform. The manuals called for an 8-foot chain leg on the sling when, in reality, the chain leg in use was only 6 feet long. Also, the 15,000-pound sling in the Army's inventory had been replaced by 10,000- and 25,000-pound slings.

Using the new sling, a soldier from Battery A, 3rd Battalion, 68th ADA, prepares a Hawk platoon command post for airlift.

Naturally, the subject matter experts questioned the validity of the procedures in the lessons and manuals, and insisted that extensive trials be conducted to verify the procedures.

First, a trial rigging of the battery control central was performed according to the current technical manuals and was found to be incorrect. Procedures for other Hawk equipment were also found to be inaccurate.

The problem was critical. If the development of the original lessons for the training extension courses continued, it could lead to a devastative threat to life and property.

The discrepancies were discussed immediately, and it was agreed that the Airborne Board, which has proponency for helicopter airlifting, would be invited to Fort Bliss to validate Hawk airlift procedures. When the representatives from Fort Bragg arrived in August 1982, they brought with them the new 25,000-pound sling. Using a 25-ton, 80-foot crane, they tried to validate the rigging procedures. However, the Airborne Board quickly came to the conclusion that the task would be impossible to accomplish at Fort Bliss because of the lack of necessary facilities, and because the procedures could not be accurately validated without an actual airborne lift. In sum, using a crane to lift the equipment was not the same as

lifting it by helicopter. The difficulty in validating the procedures was further magnified by the lack of wind factor and aerodynamic behavior in flight.

The problem led to a thorough analysis by the Army Air Defense Artillery School and the Airborne Board. Immediate action was taken to develop and validate new procedures for the preparation of Hawk equipment for helicopter transport, using force development testing and experimentation funds.

After a formal request for this validation was submitted to the U.S. Army Training and Doctrine Command in September 1982, it was recommended that the Airborne Board be tasked to modify the written procedures of the technical manuals to include the use of the new slings.

During the trials conducted earlier this year at Pope Air Force Base, N.C., all major Hawk end items—including launchers, radars, battery control central and platoon command post—were tested with 10,000- and 25,000-pound slings hooked to a CH-47 Chinook helicopter. Equipment for the test was furnished by Battery A, 3rd Battalion, 68th ADA, at Fort Bragg. Only the cages of the pulse acquisition radar proved troublesome during the two-week testing period. Because of the light weight of the cages, they could not be stabilized in flight. To prevent the possibility of equipment damage, it was determined that the cages would have to be placed inside the helicopter.

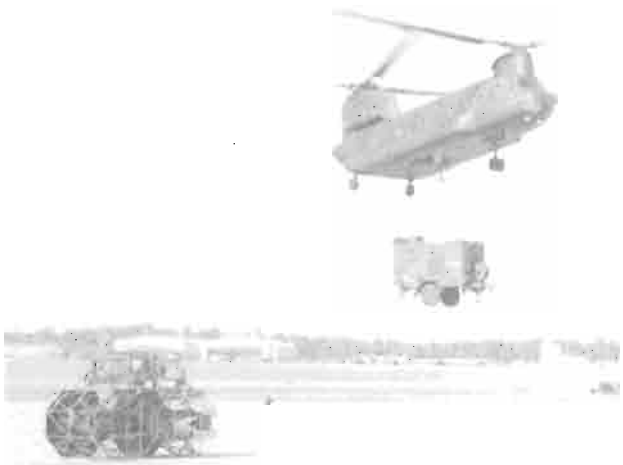
A possible safety problem also existed in determining where the hook-up man would stand during hook-up procedures of the continuous wave acquisition radar due to the lack of proper clearance between the radar and the helicopter. For obvious safety reasons, the hook-up man could not be placed on top of the radar antenna. The antenna could not be lowered to its stowed position because of the time factor involved in raising and lowering it and the potential difficulties of stabilization during flight aerodynamics. Therefore, it was determined that the shepherd's hook would be used in the hook-up procedures.

The Army Air Defense Artillery School has recommended that Hawk units include both the 10,000- and 25,000-pound slings in their inventory of authorized equipment. The school is also looking into the possibility of airlifting two Hawk major end items in a single flight, using a modified CH-47 helicopter. However, tactical evaluations of those procedures have not yet been scheduled.

For those major end items tested, the airlift procedures were validated in accordance with the Airborne Board's criteria. Modified procedures have been written for preparing and rigging Hawk end items of equipment for movement by helicopter.

These new procedures will have a positive impact on the preparation of Hawk equipment for helicopter travel in that the new slings will eliminate the need for spreader bars, thus reducing rigging time while allowing for a more efficient airlift.

There is no doubt that the modified lessons, together with photographs and information gathered during the airlift validation, will greatly improve the Hawk missile system's mobility. At the school, the Hawk training extension program has been upgraded, and changes to the technical manuals are being prepared for publication and distribution to the field later this year. ✱



A CH-47 Chinook helicopter airlifts the Hawk platoon command post. Notice that the new sling eliminates the need for spreader bars. The pulse acquisition radar cages failed to stabilize in flight because of their light weight. In the end, it was determined that the cages would be stowed inside the helicopter during airlift operations.

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SGT PARKS *has been assigned to the Hawk Division, Directorate of Training Developments, U.S. Army Air Defense Artillery School, Fort Bliss, Texas, since March 1980. A graduate of the Basic Leadership Course, he is the project NCO for validation of Hawk airlift procedures.*

Women In the Army
Review Group Results

Since 1972 large numbers of women have entered the Army in a wide range of skills and specialties. Currently, more than 65,000 enlisted women are serving throughout the force. Over the past 10 years, however, concerns have surfaced regarding proper utilization of women soldiers. These concerns range from the high attrition rates of women soldiers to their actual employment on the battlefield.

The Women in the Army Policy Review Group was established by the Department of the Army in May 1981 as a result of concerns expressed by senior commanders. The review group was tasked to review and assess current Army programs affecting women soldiers as they relate to operational readiness, deployability and retention, combat effectiveness, quality of life, current approved doctrine, unit employment and the classification and assignment of soldiers.

The review group addressed the central issue of female content planning. Two major research efforts were developed. The first was an MOS physical demands analysis and the development of a gender-free physical capacity test. The second was a direct assessment of female combat exclusion.

Committee Results Affect Men As Well As Women

Based on findings regarding strength and stamina of both men and women, the review group found a need for a gender-free physical standard to be used for both men and women as they enter the Army. This standard, when employed, will increase the probability that soldiers can perform the full spectrum of their duties. The gender-free physical demands analysis will be accomplished by fielding a military enlisted physical strength capacity test (MEPSCAT) battery at military enlistment processing stations in October 1983.

The test now being validated will determine if new recruits, both men and women, have the physical capacity to accomplish all the tasks associated with their specialties. The test will give soldiers a better chance to succeed in their Army careers.

The review group also recommended that 23 additional MOSs be closed to women due to their close association with direct combat. As a result, the Army ceased recruiting women for skills shown in Figure 1.

Women who have enlisted under the delayed entry program for one of the 23 specialties are being offered the chance to renegotiate their enlistment contracts. If affected soldiers desire not to accept another enlistment option for which they are qualified, they may be released from their commitment. Female soldiers who possess one of the 23 MOSs may continue to serve the remainder of their current enlistment unless they choose to apply for voluntary reclassification. Those who choose not to undergo voluntary reclassification but opt to remain in the service will be required to select another specialty. The selection must be made at their expiration of term of service (ETS) or re-enlistment or at the overseas permanent change of station point if re-enlistment is required to meet tour length obligations.

Re-enlistment and reclassification will be targeted to place the affected soldier in a skill providing career opportunities. Each affected soldier will receive a personalized letter through her chain of command explaining the need for her to change her specialty and describing the available options. Commanders will also receive a separate letter with detailed instructions and background information.

A third element recommended by the review group was a revision of the Army's Combat Exclusion Policy. The 23 MOSs added to the existing combat exclusion list of 38 specialties bring the total of MOSs closed to women to 61.

23 MOSs Added to Combat Exclusion List

00B	Diver
13R	Firefinder Radar Operator
16J	Defense Acquisition Radar Operator
17B	Field Artillery Radar Crewmember
17C	Field Artillery Target Acquisition Specialist
23U	Nike Hercules HP Radar Simulator Repairman
26F	Aerial Photo Sensor Repairman
26H	Air Defense Radar Repairer
26K	Aerial Electronic Warning/Defense Equipment Repairer
45G	Fire Control Systems Repairer
51B	Carpentry and Masonry Specialist
51K	Plumber
51R	Interior Electrician
52G	Transportation and Distribution Specialist
54C	Smoke Operations Specialist
54E	NBC Specialist
62E	Heavy Construction Equipment Operator
62G	Quarrying Specialist
62H	Concrete and Asphalt Equipment Operator
62J	General Construction Equipment Operator
67T	Tactical Transport Helicopter Repairman
67U	Medium Helicopter Repairman
82B	Construction Surveyor

Figure 1.

Women Still Eligible For 83 Percent of MOSs

Women are still eligible, however, for 83 percent of the Army's 350 specialties. A direct combat probability coding (DCPC) system was designed to better identify those positions in Army units with the greatest probability of routine engagement in direct combat. A numerical coding system (probability 1 through probability 7 [P1-P7]) was developed to assist in the identification process. Code P1 represents high combat probability while P7 represents no direct combat. Women will not be assigned to positions coded P1.

Implementation Schedule

Data regarding the MEPSCAT is being collected from the MEPSCAT validation recently conducted at Fort Jackson, S.C. Army leaders will be briefed on the results this summer and the MEPSCAT will be implemented Oct. 1.

Headquarters, Department of the Army, in concert with school proponents, is validating all probability

codes. The validation process will be completed sometime this summer. A list of units closed to women will be published once the validation is completed.

Questions and Answers

Question: Will the MEPSCAT affect in-service members? *Answer:* The MEPSCAT will be used for new accessions only. In-service members will not be required to take the new test.

Question: Why is the Army implementing MEPSCAT? *Answer:* The MEPSCAT is designed to assess the physical capacity of a soldier, man or woman, prior to placement in a skill in which the soldier might not succeed due to heavy physical work demands. The Army hopes the new test will reduce attrition and increase the retention of both men and women in the skills for which they ultimately will enlist.

Question: What are the physical demand categories? *Answer:* There are five physical demand categories. The categories are listed in Figure 2.

Question: What retention data suggested that female soldiers were not retained in heavy and very heavy jobs? *Answer:* The Army found that 75 percent of female soldiers and 57 percent of male soldiers who enlisted in 1978 and were assigned heavy or very heavy skills left their primary MOSs at reenlistment time. The same data showed only 23 percent of female and 34 percent of male soldiers who possessed light to moderately heavy physical demand MOSs left their MOSs.

Question: Were migration data the only data used in determining the need for a MEPSCAT? *Answer:* No. Using the same 1978 cohort data, the Army found the attrition rate for women was 49 percent. The attrition rate for men was 31 percent. The Army also found women were either underutilized or poorly utilized at a rate of 21 percent. Further, women re-enlisted for heavy or very heavy skills at a rate of 16 percent compared to a male retention rate of 18 percent. In other words, both men and women were being affected by the lack of a physical work capacity test at the time of enlistment.

Question: I have already received the letter providing me options for reclassification or re-enlistment but would like to take more time to decide in which skill I desire retraining. May I request, at a later date, reclassification prior to my ETS in a skill of my choice? *Answer:* Yes. The skill you select must be required by the Army to insure adequate, long-term career opportunities. Additionally, the exact timing of your reclassification would be based on training availability in the skill you select.

Question: What type training can I expect if I select reclassification? Could it be on-the-job training? *Answer:* Training provided soldiers selecting reclassification or re-enlistment will be formal training, not on-the-job training.

Question: Why were the 23 MOSs added to the combat exclusion list? *Answer:* The 23 MOSs closed have a high probability of routine combat engagement. As an example, carpenters, plumbers and even electricians can be required to serve as combat engineers under combat conditions.

Physical Demand Categories

CATEGORIES	REQUIREMENTS
Light	
Automatic Data Telecommunications Center Operator	Lift 20 pounds maximum with frequent lifting of 10 pounds.
Medium	
Avionic Navigation and Flight Control Equipment Repairer	Lift 50 pounds maximum with frequent lifting of 25 pounds.
Moderately Heavy	
Tactical Systems Microwave Systems Operator	Lift 80 pounds maximum with frequent lifting of 40 pounds.
Heavy	
Wire Systems Installer Operator	Lift 100 pounds maximum with frequent lifting of 50 pounds.
Very Heavy	
Infantryman, Engineer, Track Vehicle Crewman	Lift more than 100 pounds with frequent lifting of 50 pounds.

Figure 2.

Question: If I elect to remain in my primary MOS (one of the 23 added to the combat exclusion list), what type utilization and career development can I expect? *Answer:* Individuals electing to remain in their primary MOS will be employed in that MOS and will continue to receive promotion opportunities based on their performance. Female soldiers will not be permitted to re-enlist for a "closed skill" at the point of re-enlistment.

Question: Will the MOSs on the combat exclusion list be closed forever? *Answer:* As doctrine, unit missions, MOS duties and the probable location of units on the battlefield change, so will the number of MOSs available to women. The intent will remain to place all soldiers in skills in which they can succeed while simultaneously placing women in positions in which they would not routinely have a high probability of engagement in direct combat.

Procedures Phased Over a Four-Year Period

Question: Will the Army's policy on closing units to women be effective immediately? *Answer:* No. Assignment and requisitioning procedures will be phased over a four-year period once positions have been validated by the Department of the Army.

Question: Will my approved joint domicile be affected by P1 closures to women? *Answer:* No. Individuals with approved joint domiciles will continue to be assigned to the approved unit, even though the unit may be coded P1.

Question: How will my unit requisition and assign women during the validation period? *Answer:* The Combat Exclusion Policy of 1977 will be used as a basis of assignment and personnel requisition. The policy was a standard procedure employed by the personnel community prior to the introduction of the direct combat probability coding system.

Question: After initial validation by the Army, will there be subsequent reviews of combat probability coding? *Answer:* Yes. As mission, MOS duties, doctrine and probable battlefield location of units change, so will direct combat probability coding. The Office, Deputy Chief of Staff for Personnel conducts specific weapon system functional reviews monthly. Reviews of direct combat probability codes are being institutionalized as part of the functional review. ✱

Mode 4 Facility Eases IFF Training Restrictions

by D. B. Berry and Mary Demiter

The U.S. Army Air Defense Center, Fort Bliss, Texas, has come up with a solution to a nagging training problem that has plagued air defenders for nearly two decades—Federal Aviation Administration restrictions on the use of identification, friend or foe, systems.

In August 1967, the Department of the Army, at the request of FAA officials concerned about over-saturation of commercial and private aircraft transponders by military IFF interrogation, instructed Fort Bliss to eliminate or reduce the use of IFF in modes 1, 2 and 3A to a minimum. FAA air traffic controllers rely on airborne transponders to vector aircraft. In 1967, approximately 150 ground-based IFF systems were operating at Fort Bliss, most of them in close proximity to El Paso International Airport and all of them busily interrogating approaching aircraft.

Fort Bliss, as a result of the Department of the Army directive, was restricted to IFF modes 1 and 2 and was authorized to operate only one IFF system at a time, a limitation that threatened to degrade the training of IFF radar operators. The solution to the IFF training restriction problem has been the creation of a mode 4 training facility which recently went into operation at Fort Bliss and is the result of years of wrestling with the IFF training problem.

The problem was originally thought of as an electromagnetic compatibility problem and was assigned to the Frequency Management Branch of Fort Bliss' Directorate of Communications and Electronics. Fort Bliss won permission in 1970 to operate five IFF systems simultaneously in support of a battalion-size field training exercise, but the FAA balked when Fort Bliss requested permission to employ 10 AN/TPX-50 IFF systems in support of an extensive forward area alerting radar training program in early 1977. Fort Bliss personnel, convinced 10 IFF systems using push-to-interrogate methods and operating in modes 1, 2 and 4 would not interfere with FAA radars operating in mode 3, requested a conference with FAA representatives.

The conference gave birth to an Army- and FAA-approved test designed to measure the impact of IFF radars operating in modes 1, 2 and 4 on mode 3 FAA operations. The test results were favorable and Fort Bliss was allowed to use 30 IFF radars at the same time. For the first time in a decade, Fort Bliss began operating enough IFF systems to satisfy U.S. Army Air Defense Center training requirements.

The primary means of aircraft identification used during exercises in the 1970s was mode 4. The OPFOR used two-day-old codes while friendly forces used the code of the day from the AK 3662 daily changing codebook. Joint readiness exercises, however, indicated a lack of training in the use of mode 4, not a surprising result considering the long period of IFF systems constraints.

Immediate efforts were made to strengthen mode 4 training. U.S. Air Force aircraft flying support for Fort Bliss tracking and ECM missions set mode 4 codes on their IFF transponders, and Fort Bliss' 3rd Armored Cavalry Regiment set mode 4 on their helicopter transponders one day each week to provide ADA radar crewmen with training targets. These steps improved training, but there were still problems.

Commercial flights no longer provided free targets, and trainers found it difficult to coordinate IFF training with Air Force flight schedules. The cost of operating aircraft for the sole purpose of IFF training was not economical. Only a minimum amount of mode 4 IFF training was being accomplished even though mode 4 operation requires several hours of initial training followed by periodic operations to maintain efficiency.

In March 1982, the director of Communications and Electronics requested Fort Bliss' Directorate of Plans and Training to help provide a solution to the mode 4 IFF training problem. The answer was the creation of a mode 4 training facility.

The chief components of the mode 4 training facility are an APX-72 transponder and antenna (mounted on a pole adjacent to the Fort Bliss building which houses the 1st ADA Training Brigade's S-2 section), a 28-volt power supply, a daily changing codebook and an on-off control box. S-2 section personnel turn the system on each morning and switch it off each afternoon. The 1st ADA Training Brigade keys the transponder each morning with the code of the day.

The mode 4 training facility provides IFF system operators with a target to interrogate throughout the normal training day. The mode 4 training facility has proven to be an ideal, economical training aid which requires no full-time crew (just someone to turn it on in the morning, key it and turn it off in the afternoon). The mode 4 facility has obvious application anywhere IFF training requirements clash with air support flight schedules or FAA restrictions. Army trainers who want to know more about the mode 4 facility specifications and operations should write CECOM Liaison Office, Fort Bliss, TX 79916 (AV 978-6300) or Commander, USACC-Fort Bliss, ATTN: Freq Mgt Br, Fort Bliss, TX 79916 (AV 978-4886) for details. ✱

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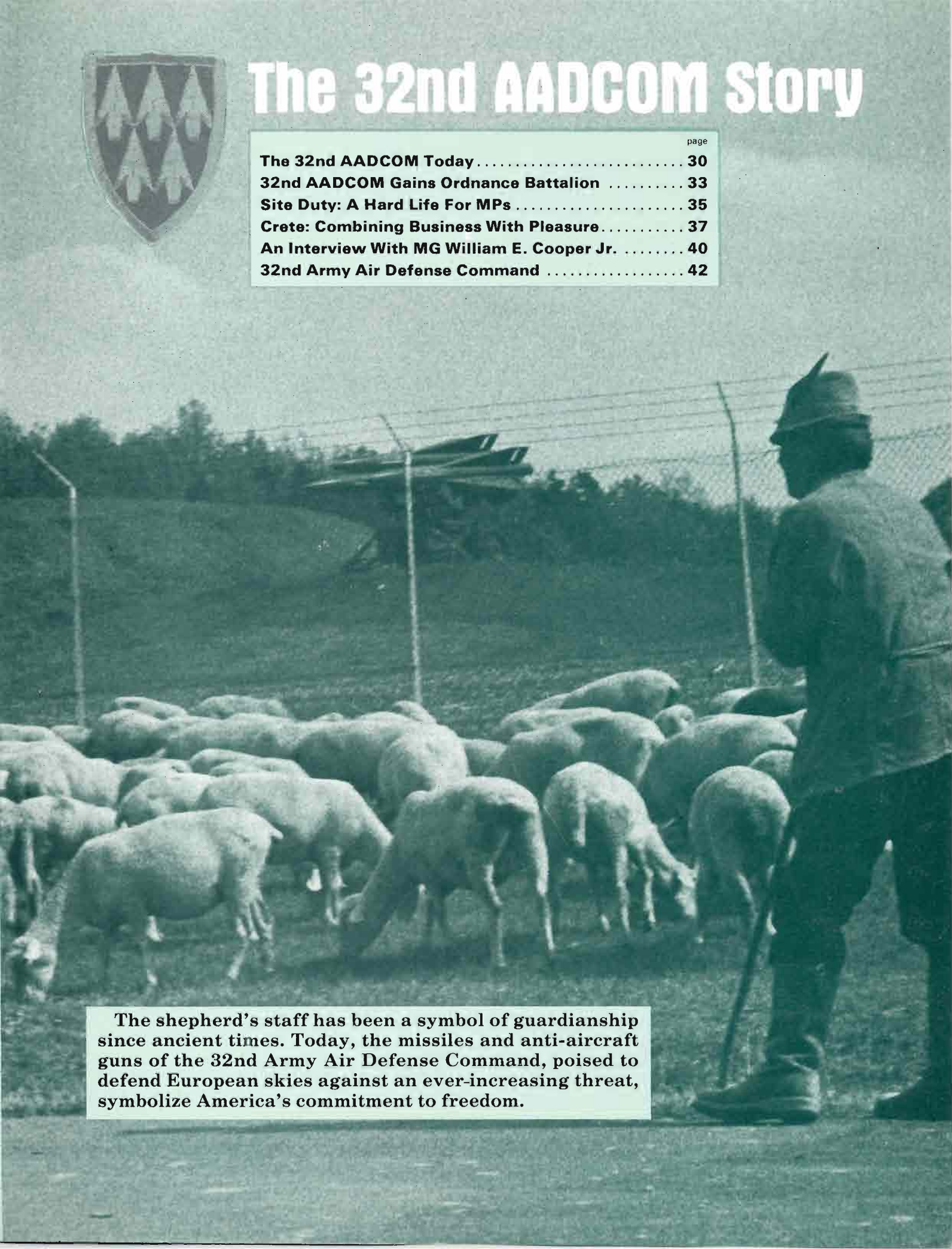
The 32nd AADCOM Story



The shepherd's staff has been a symbol of guardianship since ancient times. Today, the missiles and anti-aircraft guns of the 32nd Army Air Defense Command, poised to defend European skies against an ever-increasing threat, symbolize America's commitment to freedom.

Defending Europe's Skies

The 32nd AADCOM Today

by SP4 Laura Bower

Historians have recorded the heroic efforts of the 32nd Army Air Defense Command's predecessors in four wars. Today, all Americans and free Europeans benefit from those valiant actions. But the struggle and the labor have not ceased, nor can they cease in the present cold war times and the recent, huge build-up of hostile forces. The 32nd has never had a more important or demanding mission than the one engaged in now, that of keeping a relentless watch on the borders of freedom.

The ominous shadow cast by Soviet and Warsaw Pact armed forces forms the basis for the American presence in Europe. The Soviet armed forces number more than 4.9 million men and more than 173 divisions. They extend thousands of miles from the Soviet Far East into Afghanistan, and from the border of Turkey to the distant reaches of northern Europe. Within East Germany, Poland, Czechoslovakia and Hungary, the Soviets maintain 30 highly trained, combat-ready divisions. Additionally, there are 37 East European divisions available to reinforce combat operations in the Central European Theater.

In support of these vast ground forces, the Warsaw Pact has increased the number of tactical aircraft deployed to more than 5,000—a growth of 25 percent during the past 10 years. Frontal aviation assets, the major threat to our air defense sites and to NATO forces in Europe, have undergone dramatic changes as newer, swing-wing aircraft like the MiG-23 and MiG-27 Floggers have replaced older, less effective models.

Soviet air forces have been reorganized into an offensive force. They have deployed three high-performance systems designed for attack against ground forces and Air Defense Artillery units—the Su-17 Fitter D, the MiG-27 Flogger and the Su-24 Fencer. The Fencer alone can carry three times the payload of the older models and carry it twice as far. It can also use air-to-surface missiles against our sites.

32nd AADCOM soldiers launch a Redeye missile during an exercise in Germany.

The Soviets have also deployed assault and attack helicopters, not only the formidable and battle-tested Mi-24 Hind, but also the Mi-8 Hip, the world's most heavily armed helicopter. This helicopter force, designed to support Soviet ground forces, represents a tremendous challenge to forward-deployed air defense units.

This massive military expansion is a stark reality. The silhouette of watchtowers and barbed-wire fences along the East German and Czechoslovakian borders provides a grim reminder of the differences between free and unfree. More than mine fields separate Western Europe and the Iron Curtain countries.

Despite the power of the Warsaw Pact, our potential adversaries have great respect for the U.S. forces in Europe. Their respect serves as a powerful deterrent but, should that deterrent fail, the American forces must be ready and able to fight and win. The 32nd AADCOM is preparing for that dread, unhoped for eventuality through its own massive upgrading of the command.

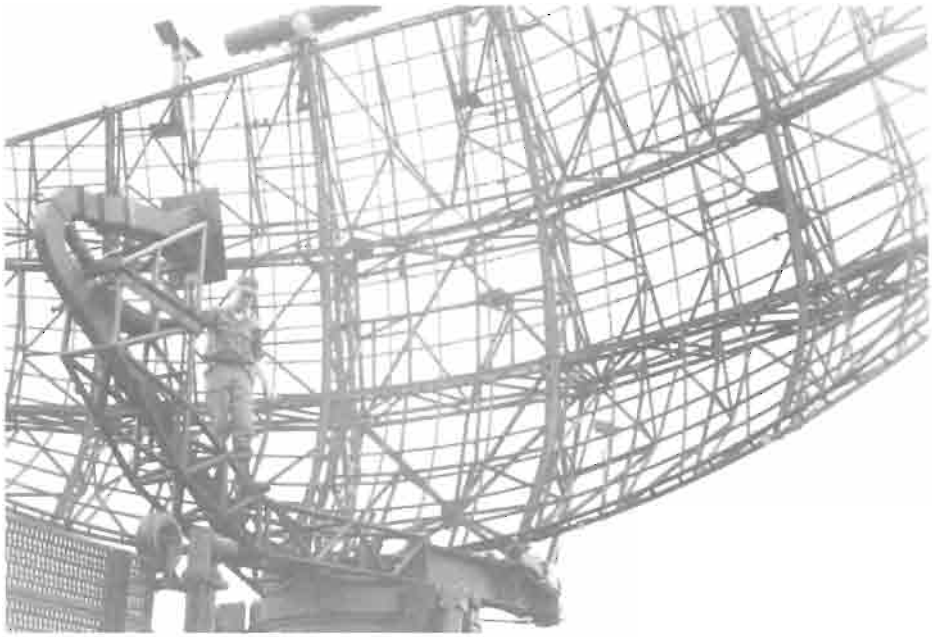
Not discounting the difficulties inherent in any transition of this scale, the command remains combat ready. The air defense systems in Europe today consist of Nike Hercules, Improved Hawk, Chaparral and Vulcan units as well as Redeye and Stinger weapon systems. The bulk of the Army's air defense mission in Europe is assigned to the 32nd AADCOM. The command is organized into four brigades plus the 3rd Ordnance Battalion, the 11th Air Defense Signal Battalion, the 247th Chemical Detachment and two missile control centers.

The 10th ADA Brigade, headquartered in Darmstadt, has two Hawk battalions, one located in Giessen and one in Wildflecken. The 10th Brigade has been selected to host the 4th Battalion, 3rd ADA, Europe's first Patriot battalion, and is finalizing plans for its reception next year.

The 69th ADA Brigade is headquartered in Wuerzburg and has battalions stationed in Grafenwoehr, Ansbach, Wuerzburg and Schweinfurt. All of its units are Hawk.

The 94th Brigade, which is located in Kaiserslautern, has five battalions: three Nike Hercules and two Hawk. The battalions are located in Neubrucke, Spangdahlem, Pirmasens, Wackernheim and Stuttgart.

The 108th ADA Brigade, also located in Kaiserslautern, has three Chaparral/Vulcan battalions, two of



An air defender stands on the feedhorn of a mobile high-power acquisition radar at a 32nd AADCOM Nike Hercules site.

them non-divisional and located at Ramstein and Spangdahlem Air Force Bases, with additional units located at Bitburg and Hahn Air Force Bases. The other battalion is a divisional battalion of the 1st Infantry Division and is headquartered in Mannheim.

The maintenance support command, the 3rd Ordnance Battalion, has supporting elements at each brigade and support batteries at each battalion. In addition, the 32nd AADCOM now has a dedicated logistics-technical channel from the headquarters to the unit level, streamlining repair parts, funds and supplies. The 3rd Ordnance Battalion also includes support for communications and electronics for the 11th Air Defense Signal Battalion.

The missile control centers, located at Boerfink and Lauda, control missile launches and direct ADA fire. Both centers are colocated with the Air Force, which makes the decision whether a fighter aircraft or a surface-to-air missile will engage an enemy aircraft. Using automatic data-link communications, the missile control centers assign targets through the brigades to the battalions.

The 11th Air Defense Signal Battalion is the largest unit of its kind in the Army. Headquartered in Darmstadt, it has supporting companies with each brigade and operates radio and relay sites around the clock throughout central Germany. The 11th is activating a new company to further improve communications between air defense units.

One of the most dispersed commands in USAREUR, the 32nd AADCOM has boundaries extending from the Eiffel area on the Luxembourg border to Regensburg, near Munich in Bavaria. The vast distances necessitate complicated lines of communication. In addition, 32nd AADCOM units, although not part of a corps, must get a good deal of their support from corps-controlled community headquarters.

Remote-site review boards are held periodically by each community and major support commands to discuss improvement projects. Batteries are represented at the community level while Headquarters, 32nd AADCOM, represents the command at corps level and at USAREUR for projects involving an entire unit.

Quality-of-life improvements during the past year to many Nike Hercules and Hawk units stress the command's concern for the individual soldier. More than $2 million worth of new furniture has immensely improved barracks conditions. Athletic courts and recreational equipment are added benefits. Office equipment and portable buildings have contributed toward increasing soldiers' performances. Improvements at tactical dining facilities include everything from decorator packages to microwave ovens.

The 32nd AADCOM has replaced the obsolete NCR 500 with the decentralized automated supply support system (DAS 3), giving it a faster response time and producing more information. The DAS 3 is fully self-contained, mobile and can be expanded to many new programs.

To assist in maintenance management, the 32nd AADCOM has installed the maintenance automated management system, which provides more accurate data while eliminating manual operations.

The new General Electric Test Set 1000 has also been integrated into Hawk maintenance operations. The test set's ability to test printed circuit boards eliminates guesswork, increases the first-time location of systems failure and dramatically improves the ability to make fast repairs.

Personnel morale boosters such as those improvements already cited are only a portion of 32nd AADCOM's ongoing campaign of upgrading. The determination to improve the command's ability to deter war, fight, if necessary, and win has resulted in modernization and replacement of existing weapon systems. The program includes the fielding of Patriot, the SGT York Gun, Stinger and a major upgrade of the Hawk and Chaparral missile systems.

Patriot is an all-weather, state-of-the art, high-technology air defense missile system. It can track and engage multiple aircraft at different speeds and altitudes simultaneously. Because of this increased firepower and capability, Patriot soon will replace the Nike Hercules and, at a later date, a portion of the Hawks.

The Hawk, however, will remain with the 32nd AADCOM. At least four battalions, and maybe more, will be converted into a vastly improved system that will serve well into the next century. Throughout the transition period and beyond, the Hawk will remain a primary air defense weapon in Europe. Its combat effectiveness, clearly demonstrated in the Middle East disputes, makes it a powerful deterrent in Europe. Although more than 20 years old, constant improvements have kept the Hawk effective, and more improvements assure its place in the future.

At present, the Nike Hercules is the only high-altitude Army air defense missile system deployed in Europe. Al-

though scheduled to be phased down over a period of years, its solid reputation, going back to the 1950s when it defended many American cities, continues to make it a highly regarded deterrent that will be used through the 1980s and even longer in some NATO countries.

The Chaparral/Vulcan battalions will trade in their Vulcans, both self-propelled and towed, for the new SGT York Gun. Its 40mm twin guns and radar components (adapted from the F-16 fighter plane) mounted on an M-48 tank chassis make it compatible with the M-1 Abrams tank on the battlefield and an imposing weapon capable of firing on the move.

The Chaparral will also improve, gaining a "head-on attack" capability that was recently demonstrated by its sister system, the British Sidewinder missile, during the Falkland Islands and Middle East conflicts. It is a highly effective missile and is scheduled to remain in use in Europe for many years to come.

Another major improvement is the fielding of Stinger to replace the Redeye. Already in the hands of infantry, cavalry and armor units, it will join air defense artillery units as the "final stopper" for aircraft that manage to penetrate first-line defenses during an all-out attack.

Directing the fires of all this sophisticated weaponry, the missile control centers are undergoing a major electronic conversion, titled GEADGE (German Air Defense, Ground Environment). Its aim is to give a faster exchange of electronic data between German and U.S. forces and a better radar link-up between Air Force interceptors and ground missiles.

The 11th Air Defense Signal Battalion will eventually transfer the day-to-day peacetime links—which now include hook-ups for Armed Forces Network Television—to the 5th Signal Command in order to concentrate on the tactical channels. To prevent the enemy from listening in or jamming the data-link and voice communications, a new generation of automatic encryption devices, called VINSON, will be added to equipment in the future.

Constantly changing, improving, honing fighting capabilities to a fine edge, the 32nd AADCOM is in a particularly vulnerable period. Although all might seem "quiet on the Western front," ripple effects can be felt from the recent crises in Iran, the Middle East, Poland and Afghanistan. Increased terrorist activities in Germany and Italy drive home the need for a fully equipped, fully capable fighting force. That force, of which the 32nd AADCOM is a member, must broadcast the message to our potential adversaries: "Peace is preferrable, desirable, but we are more than ready, willing and able to defend our freedoms and those of our allies."

During REFORGER '82, elements of the German Army joined forces with the 32nd AADCOM for the exercises. Here, a German soldier guards against ground and air threats with a twin MG-1 machine gun. The Hawk missiles belong to Battery A, 2nd Battalion, 57th ADA.

By the late 1980s, the stationing of the 32nd AADCOM will have undergone basic changes. Construction of new Patriot sites has already begun at Giessen and Hanau. Following these sites, construction will start at Dexheim, Kaiserslautern, Wuerzburg, Ansbach, two sites near Munich, and Bitburg. The total cost will be about $500 million.

32nd ADDCOM soldiers practice NBC skills with Hawk missiles while on maneuvers in a German forest.

All of the batteries of a Patriot battalion will be colocated, rotating periodically to the tactical sites. Although all of the batteries of the Hawk battalion will not be located together, relocation of Hawk units to the rear area will result in a compression of administrative, logistical and tactical operations. For the first time, Hawk battalion commanders will be able to assemble, with little difficulty, all of their soldiers in a central location.

The signal battalion will continue to grow throughout this decade; in fact, it may eventually be redesignated as a signal group. By 1990, the 32nd AADCOM will have four brigades that will include nine Patriot missile battalions, three SHORAD battalions and four vastly improved Hawk battalions. Currently, the possible retention and deployment of two additional light Hawk battalions are being studied.

Although faced with one of the most demanding missions in the Army today, the 32nd AADCOM has no intention of being left behind as the entire Army undergoes transformation into a force that will remain effective well into the 21st century. Instead it will be a model of force modernization activity, while continuing its important role as defender of the European skies. ✱

32nd AADCOM Gains Ordnance Battalion

Under the collective heading of "force modernization," there are many unit colors passing hands throughout the Army and a lot of changing shoulder patches. So at first glance, release of the 3rd Ordnance Battalion from the 59th Ordnance Brigade and its reassignment to the 32nd AADCOM in November 1982 would appear to be routine—another entry on the seemingly endless list of battalion-size units requiring the change of a few chain-of-command photos on the orderly room walls.

The significance of this restructuring, however, is so involved that even those who innovated the change probably could not have foreseen all of its implications.

The 3rd Ordnance Battalion now has the mission of providing the 32nd AADCOM direct, intermediate and general support maintenance and supply, maintaining and issuing the operational readiness float, operating direct exchange activities and providing classification and evacuation in support of the Theater Army Materiel Management Center.

The battalion now provides dedicated supply and maintenance support for 32nd AADCOM air defense systems and associated ground support equipment. This involves, for example, direct exchange of everything from jeep tires to Patriot missiles.

Simply stated, this is the "what" of the 3rd Ordnance Battalion; the real issue is the "how." At this point, there are absolutely no historical facts available for comparison of a difficult support role that stretches over more than 56,000 square miles.

This lack of historical information makes the "how" of implementing a recognized "what" a new ball game. The studies, plans and research conducted between the original concept and the actual implementation of the plan remain as outlines—merely strip maps—as the command forges ahead into new territory.

SP5 Curtis A. Milton and SP5 Harold Fields replace circuits on an improved continuous-wave acquisition radar. The "third shop" goes wherever a problem exists.

As the transition began, the 32nd AADCOM gained Headquarters and Headquarters Company, 3rd Ordnance Battalion and its 4th Ordnance Company. Over a period of months the battalion absorbed the platoon-size, direct support units from each of the 32nd AADCOM battalions. These units

SP5 Howard G. Ward reviews supply status listings at the 3rd Ordnance Battalion Materiel Management Center. If parts exist anywhere, the 3rd Ordnance Battallion will find them.

were then reorganized into full batteries and, in addition, the four brigades of the 32nd AADCOM gained platoon-size, brigade support elements, also under the control of the 3rd Ordnance Battalion.

In the next step, the 3rd Ordnance Battalion established a fully operational materiel management center designed to provide theater-level support.

The resulting logistic support concept is based upon a myriad of requirements. It is meeting hundreds and hundreds of goals involving thousands of people. Since there are no comparable experiences upon which to base the operation, the big picture remains somewhat a mystery to the soldiers under its direct effect—the officers and non-commissioned officers in Air Defense Artillery.

SP5 Michael A. McCollums, a DAS 3 computer operator with the 4th Ordnance Company, 3rd Ordnance Battalion, checks supply data on his console.

That big picture, however, is really a concept easily understood and familiar to everyone in the Army. A "super supply sergeant" has just been assigned to the 32nd AADCOM. And he has already started performing his magic. The secret to the 32nd AADCOM's new supply sergeant is the same as that of any other—connections.

Instead of a black notebook, the 3rd Ordnance Materiel Management Center uses a computer to keep track of the connections. The result, however, is the same. If needed parts exist anywhere, the 3rd Ordnance Battalion will come up with them.

For example, if a part normally stocked at battery level is needed, the request is processed up through the channels of the 3rd Ordnance Battalion, from the soldier at the battery to the materiel management center. The materiel management center is then able, by computer search, to locate the part in any other battery within the command and arrange for its transfer. It's as simple as making a few phone calls.

The words "third shop" don't have to scare anyone in the 32nd AADCOM ever again, because third shop and their own people are basically the same people and the third shop comes to their motor pool, shop, tactical site or wherever the problem exists.

"Not in stock" is a phrase unlikely to be heard again, because every small shop has a supply room that, in effect, stretches over the whole of southern Germany. Although the people involved rotate at a normal rate, the connections will remain intact.

So, from jeep tires to the most complex weapon systems, everything is now available to everyone at every level. Better still, the new support concept doesn't involve "calling in any favors." In addition to making day-to-day operations run smoother, there won't be any sweating over "How did you get that?" when annual general inspection time once again rolls around. ✱

Site Duty: A Hard Life For MPs

by SSG Mike Myers

In the past nine months, she has carefully studied every inch of the inside of her 4-by-4-foot room in the tower. Inside, she has no reading material, no food to snack on, no radio or tape player to provide music or the sound of a human voice. If she wishes to smoke a cigarette, there is a built-in electric lighter on the wall—she cannot have a lighter.

In silence, she stares out the window. Her eyes latch on the little activity that takes place in her remote location. Occasionally, someone walks through the woods, but usually there is only the movement of tree branches in the wind. Sometimes, in the stillness, she can see the grass growing.

She dreams. Perhaps she is a princess waiting for a fairy-tale prince to ride out of the treeline on his white horse and rescue her from her tower confinement. More than likely, though, it is a simpler dream of good food, nice clothes and, maybe, dancing.

Her real dream, however, is to be able to take off her steel pot, web gear, flack jacket and turn in her M-16. She wants to put on a white hat, shiny black leather holster, and be issued a nightstick and badge.

PFC Meredith Knudson is a cop. Like all the military police in the 32nd AADCOM, her duty is physical security. Her unit, Battery A, 2nd Battalion, 56th ADA, is a Nike Hercules unit. The MPs there work 24-hour shifts—24 on and 24 off. They get a three-day break about every 60 days.

Their job is plainly stated, in both German and English, on signs all around the tactical site. Beneath two pictures of a skull and crossbones, the signs sum up the role of the MP:

USE OF DEADLY FORCE IS AUTHORIZED

The responsibility of holding another person's life in their hands is one taken very seriously by the MPs at the 2/56 ADA because the mission is starkly real. Unlike the majority of soldiers who "practice war" during field training exercises, these MPs pull war-zone duty every day they work. Their duty gives them a certain pride in their work—a special something that keeps them performing at their utmost. They are some of the Army's best.

An MP pulls guard duty in one of the towers at Battery A, 2nd Battalion, 56th ADA.

Physical security MPs are the only peacetime soldiers in the Army faced with this responsibility.

About a year ago, Knudson was at Fort McClellan, Ala., learning to be an MP. One day she started the screening process that ultimately led to her selection for site-security duty. She was interviewed by her commander, her past was carefully checked, and she took a medical examination.

"I was really happy when I got picked. I felt really good about it; I mean not everybody gets selected," she said. "It made me feel good that they thought I was reliable enough to do it, but now—well, I didn't know. . . ." Her voice trailed off as she stared out of the window of the tower. A moment later, she looked back. "It's not really that bad."

Tower duty—there are four towers at their site—is generally considered to be the worst duty by the MPs in Battery A. The guard shacks at the gates are marginally better, but the best duty is being on the security alert team.

"It's not lonely and you get more sleep," said SP4 Rob Helm. "You get called to run to this post or to that post, and you run. It gives you something to do, you've got people to talk to, it's not quite as boring as being stuck in the tower."

Helm sat in the break room of the ready building with the other two members of the security alert team, PV2 Joe Gallager and PVT Thomas Ellis. They were joined by the three other MPs, PFC Robert Peregoy, PV2 Cynthia Dubas and PFC Lisa Winter, who were getting ready to relieve the shift in the towers.

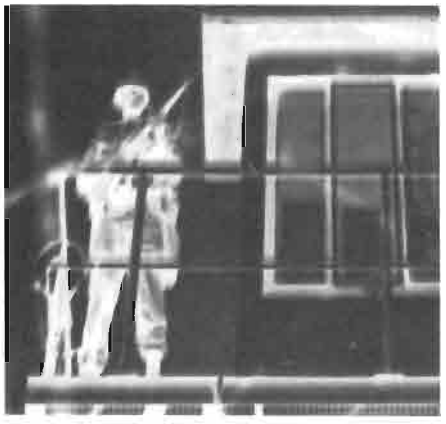
They discussed the most urgent news of the day, the door that was broken on Post No. 9, the tallest of the towers. After dusk, they expected a drop in temperature and they were expressing, in advance, sympathy for whoever was going to be cold as well as bored.

Boring is the way the MPs at Battery A describe their job, and boredom, they say, is their biggest problem. For the male soldiers, getting to the site is a 40-minute bus ride from their barracks. The females live closer, in billets at the battery administrative area.

Once on the site, they don't leave for 24 hours. When they are not physically at a guard post, they pull detail, take skill qualification test classes and undergo various other types of training. Sometimes, particularly in the evenings, they have free time. For recreation, they have a volleyball and net. They also have a video machine and 14 movies, which most of them have seen 14 times.

"You've got to stay positive. You

An MP walks his post at one of the 32nd AADCOM's Nike Hercules sites. The guard shacks at the gates are marginally better than tower duty, but the best duty is being on the security alert team.



This infrared photo shows an MP in one of the guard towers at night. Once on site, the MPs don't leave for 24 hours.

have to make your own fun," said Helm. "You write letters home; you play cards; you just generally joke around."

"Anything you can do to make people laugh, you do it. Everyone here is a comedian," said Peregoy.

"Basically, it is a matter of keeping yourself entertained for 24 hours," said Dubas.

"Really, all you have to do is sit around and listen to Gallager tell war stories," said Ellis. "He has some winners."

Gallager looked embarassed, hinting that maybe his stories weren't exactly true. "You spend a lot of time here. A lot of tension can build up. You've got to be able to say, it's not too much. You can never say, that's too much."

"Only one female made it through the entire 18 months at this site," said Winters. "The rest of them ROTAed out."

ROTA is a plan designed specifically for physical security MPs. Formerly only for the lower enlisted, it has recently been expanded to include E-8s. Basically, it allows the MP to rotate from site to white-hat duty somewhere in Europe halfway through his or her tour.

Helm and Gallager didn't use the plan and both are within three months of rotating back to the United States. Both are looking forward to white-hat duty.

"I don't think it's the duty so much," said Helm. "I think that the biggest thing is that I'll be in an MP unit—there'll be MPs in charge. That's got to be easier on you."

"Yeah, we have some rivalry with ADA people," said Dubas. "We both think our job is more important."

"But when we were really short of people, they had to pull some of our tower duty," said Winters. "So, they know what we are going through."

Peregoy doesn't think he will use ROTA either, although white-hat duty does seem tempting. "I think the secret to this place is that we are more of a family," he said. "We're all about the same age and there is nobody you can't get along with, even the sergeants of the guard."

"The sergeants of the guard come down from the towers," said Ellis. "That makes them a lot more understanding because they know what it's all about."

"Well, nothing against you guys, but I'm not going to stick it out," said Dubas. "I'm definitely going to ROTA out. Sorry, guys."

"Well, you females have it rougher than us," said Ellis. "I mean, where we are, we've got three or four bars around and we've got a train station. But out here, there's nothing you can just walk to; the girls really can't go anywhere in their off-time because everything is just too far away," he said.

"I don't know if I'm going to make it or not," said Winters. "I've been here nine months now and I like it. But still, I could have a nervous breakdown."

The sergeant of the guard came into the break room and announced it was time to get ready to change shifts. At about the same time, the security team was called to a post at the far end of the site.

"The people out here are good to work for and good to work with," said SGT Joseph Ward, sergeant of the guard. "Sure, it's hard to get them out of bed sometimes, but I can understand not being in a hurry to get out here and start duty. There are some days when I wish it took two hours to get up here on the bus but only 20 minutes to get back."

Knudson's four hours in the tower were over. Already she was looking forward to the weekend, but not because she was going to get any time off. "It can be really nice out here on the weekend," she said, "when there is nobody out here except the MPs on duty. We sort of let details slide until later and have more fun when we're not in the tower." ✶

Crete: Combining Business With Pleasure

by SSG Mike Myers and SP4 Linda Bowers

The town of Hania on Crete stretches out like a white crescent against the blue foreground of the Aegean Sea.

Eleven months of the year, the air defenders of the 32nd AADCOM face the cold, grey skies of Germany. But if they're lucky and, more importantly, skilled enough at their jobs, they get to spend at least one of two weeks of the remaining month on the sun-blessed island of Crete. During that week, they undergo annual service practice.

The Greek island of Crete sits in the middle of the Aegean Sea; sort of a desert in the middle of an oasis. Under a merciless sun, the little vegetation is baked to shades of dusty green and brown.

Amid this setting, on Suda Bay, lies the NATO Missile Firing Installation. NAMFI is considered to be one of the, if not *the,* best missile ranges in the world. Operated on a multinational basis, its services are at the disposal of the nations that provide the resources required to operate and support the range.

NAMFI has an extended network of facilities that provides support for the assembly, launching, tracking and data collection for all of the weapons used on the range—everything from Redeye to Nike Hercules and Lance.

NAMFI is under the operational control of the Supreme Headquarters Allied Powers, Europe, and administered by the Greek Armed Forces Command. Geographically, the majority of the range consists of open sea, appropriately named the Sea Firing Range. A monitoring element is also located on the island of Thera.

On land, NAMFI operates a vast network of complex equipment used for guidance, tracking and communications, in addition to the assets used by firing batteries. The range is manned by a highly skilled staff which must stay abreast of any changes in weapon development.

NAMFI's history dates back to 1957—the year that air defense missiles were first introduced to Europe. At that time, the Advisory Group for Aeronautical Research and Development was assigned the task of selecting the most suitable area for a missile range. The present site on Crete was selected primarily for geographical reasons. The sea surrounding Crete made safe firings over water possible and a nearby airfield made the movement of troops and equipment by air practical.

The weather proved to be an added bonus. The conditions there guarantee favorable weather and allow the use of the range 12 months a year.

In November 1959, the Hellenic Ministry of Defense announced its consent for the establishment of NAMFI on Crete. In June 1965, the Multilateral Agreement was signed by Belgium, Denmark, France, the Federal Republic of Germany, Greece, the Netherlands, Norway and the United States. This agreement set forth the terms and conditions under which the NAMFI range would operate.

The range was opened Feb. 28, 1968, with the official inauguration ceremony taking place May 17.

Since its opening, NAMFI has kept and maintained an impressive record. The fact that no unit has left NAMFI without having conducted its firing within the scheduled time makes for a proud NAMFI team of evaluators.

Air defenders go to Crete to qualify on their unit's weapon, be it Nike Hercules, Hawk, Chaparral or Redeye. But not all of their time is spent on the range.

After three days of drilling in sweaty fatigues in the baking sun, the air defenders can exchange missiles, uniforms and boots for shorts, sandals and a night on the town in Hania.

Hania, as introduced through the open window of a taxi, is a curving bay of tranquil water, an almost too perfect, romantic lighthouse on a small peninsula, the unique scent of fish, salt

1LT Thomas W. Williams of Battery A, 3rd Battalion, 7th ADA, loses his hair following annual service practice on Crete earlier this year. The haircut was the result of a bet with the enlisted personnel of the battery. If they topped Battery B's score of 99.0, he said he would get his hair cut off; if they didn't, he would cut theirs. Battery A scored 99.50—the highest score for a Hawk battery since NATO started keeping records in 1957.

water and island flowers, and the crescent curve of the white city around the blue of the bay.

Walking through the bustling city dispels the peaceful image. Harsh Greek voices hawk wares spread out in abundance. Handwoven wicker baskets are piled to ceilings, joining the natural sponges hung from the rafters. Ripe fruits in a medley of greens, purples, yellows and reds tempt the parched tourist.

Freshly plucked fowl dangle from rafters in seemingly pathetic nakedness. Mountains of postcards, native sundresses and locally turned pottery are displayed in the windows of stores bearing the names of forgotten Greek gods.

The restaurants feature exotic menus, including shrimp and squid. Souvlakia, highly seasoned roast pork or lamb served as a shish kebab or wrapped in pita bread is a definite favorite and long remembered by the visiting air defenders.

The clubs and discotheques, like the rest of the town, go out of their way to cater to the English-speaking tourists. Ninety percent of the music is American and the advertisements are usually in English. Dark-eyed Greek youths dance to rock 'n' roll and disco, sharing the floor with the visiting Canadians, Britons and Americans.

Hania by moonlight is lovely and certainly more serene than Hania by day. Couples stroll by the waterside where moored fishing boats tug gently at the dock. Sleepy Greek children answer their mothers' "Hela" and run to welcoming arms. The stores finally draw in their goods for the night and the narrow streets reluctantly empty of people. The stone lighthouse beckons the last adventurous few.

Of course, when one remembers Hania, he cannot forget the beach.

When you shop for meat on Crete, you really get a good look at what you are buying. Notice that there are no flies.

There is no reason not to write home. Hania features postcards with idyllic scenes to suit every taste.

A 32nd AADCOM Chaparral missile leaves the launcher in a cloud of smoke during annual service practice at the NATO Missile Firing Installation on Crete.

The fruit and vegetables on Crete are so appealing that you end up buying a basketful to take with you.

The nearby mountains provide Hania with a constant breeze that keeps the Greek sun from seeming unbearably hot.

Greek beaches are truly all that has been written about them and more. The water is three shades of blue, beginning with a transparent turquoise, merging with a royal blue and finally becoming a deep purple that is almost black. The beach is a small ocean itself, one of hot, white sand, inviting even the casual stroller to lay down and bask in the Mediterranean sun for a while.

So, for our air defenders undergoing their annual service practice here, Crete offers the opportunity to mix business with pleasure and the chance to reap the benefits of another culture. ✱

An Interview with MG William E. Cooper Jr.

MG William E. Cooper Jr. has spent most of his 33-year career in air defense assignments, including his present position as commanding general of the 32nd AADCOM, which he has held for the past three years. On Sept. 1, he will turn the reins of command over to MG Victor J. Hugo Jr.

In the following interview with Air Defense Artillery magazine, he discusses the role of air defense in Europe, the fielding of new missile systems, such as Patriot, and what air defenders can look forward to in their European assignments.

MG William E. Cooper Jr.

ADA magazine: Whenever the subject of missiles appears in the news, the Soviet Union is sure to be mentioned. How do you, as commander of the 32nd AADCOM, perceive the threat?

Cooper: The massive expansion of the Soviet military is a stark reality. The German borders with their barbed wire, watch towers and mine fields can only serve as a constant reminder to anyone stationed in Europe that the threat is real—that there is an absolute separation between East and West. At this moment, we are an effective deterrent. This effectiveness, however, will last only as long as we remain ready to fight and win—whether it be tomorrow or anytime in the future. Currently, a massive upgrade program throughout the command is preparing us for entry into the 21st century.

ADA magazine: What specifically, does that modernization include?

Cooper: Obviously, at the forefront is the fielding of Patriot later this year. In addition, we will be getting the SGT York Division Air Defense Gun and the Stinger. To our existing systems, major upgrades are scheduled for both the Hawk and Chaparral missile systems. Already, our command has been reorganized into brigades. We have redeployed some of our Hawk units, activated a maintenance support organization, the 3rd Ordnance Battalion, and started the phase down of our Nike Hercules units.

ADA magazine: It is common knowledge that the Nike Hercules is on the way out. What about the future of Hawk?

Cooper: First, although it is scheduled to be phased down over a period of years, the Nike Hercules is not going to disappear from Europe completely. It is a time-proven weapon and will be with NATO through the 1980s. It is slowly being phased out of the U.S. force structure to provide space for the new Patriot units.

As for the Hawk, through and even after the transition period, it will remain a primary air defense weapon in Europe. Its effectiveness has been clearly demonstrated in combat, particularly in the Middle East. Although it has been in the inventory for more than 20 years, constant upgrades and high-tech improvements have kept it more than adequate against the growing threat. The latest improvements include the addition of television tracking capability and making its tracking radar solid-state. I foresee the Hawk being with us, in ever improving forms, well into the next century.

ADA magazine: What about the SGT York Gun? And will the Chaparral be able to keep up with its role as a partner in the SHORAD units?

Cooper: The Chaparral is getting an increased capability—the head-on-attack, recently proved by the British Sidewinder in the Falklands. The Chaparral is a highly respected weapon. It will continue to be upgraded, and it will be with us for many years to come.

The SGT York Gun, for which we will trade in our Vulcans, has the ability to move on the battlefield with the M-1 Abrams tank. Its radar components, many adapted from the F-16 fighter, give it the ability to fire on the move. Here in Europe, these two things make it one of the most exciting improvements in Air Defense Artillery today.

ADA magazine: And the Stinger?

Cooper: It is already in the hands of armor and cavalry units over here. In our units, its primary use will be for self-defense—the last and final "stopper" in an all-out air attack. Its infrared attack-from-all-angles feature gives it great flexibility and a high kill rate.

ADA magazine: With all of these new weapons coming, I suppose that there will be some changes in the missile control centers as well.

Cooper: Yes, both of our MCCs—Boerfink and Lauda—are converting to GEADGE. This stands for German Air Defense Ground Environment which provides for a faster exchange of electronic data both with German air defense forces and with Air Force interceptors. By being able to choose immediately who is best able to engage a specific target, we will greatly improve our effectiveness and the effectiveness of our allies.

ADA magazine: How are these changes going to affect your soldiers?

Cooper: Obviously, it affects all of us. Perhaps the most important change will be the requirement to move many soldiers, and their families, on short notice. Fortunately, these short-notice PCS moves will be minimal.

Modernization—for the whole Army, not just air defense—will mean training. Training to do the same job, but

with a drastically improved weapon system, or perhaps even training on a totally new weapon.

Throughout this period, however, we will still have the same requirement upon us, and that is being able to fight and win.

ADA magazine: What can new Patriot soldiers, coming into your command, expect upon arrival in Europe?

Cooper: I feel that they can expect great things. For a start, they will live in two- or three-man rooms with a private bath in the most modern billets anywhere in the Army. They will have greatly improved recreational and dining facilities. All of the batteries of the battalion will be located together within a military community so that they will be close to facilities such as the PX and commissary. Tactical site duty will be based on periodic rotation.

I should point out here that the rest of our soldiers have not been forgotten. They can expect a major upgrade of the current administrative areas. Our Hawk units, for example, will be moved to the rear. This will greatly compress the battalion zone of administration. Although they will not be colocated like the Patriot, the commander will be able to assemble, for the first time, his entire unit in a central location within a short period of time.

Remote site living is not going to disappear from our command, but it is getting better all the time. We are spending vast amounts of money to provide people on the sites with everything from libraries to racketball courts. In fact, I suspect that as living there keeps improving, many of our soldiers wouldn't trade their site for the biggest military community in Europe. ✱

Air Defense Artillery *magazine is grateful to the staff of the 32nd AADCOM Public Affairs Office for their contribution to this issue's special feature section on air defense artillery in Europe. Many readers will recognize the staff's bylines and photo credits from the* 32nd AADCOM News, *the official Army newspaper of the 32nd AADCOM.*

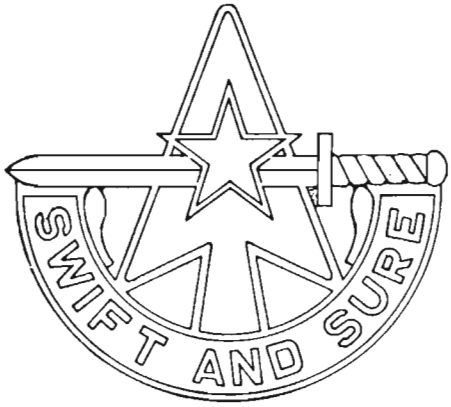
SSG MYERS *is editor of the* 32nd AADCOM News. *He has been in the Army since 1976 and is a graduate of the journalism and photojournalism courses at the Defense Information School, Fort Benjamin Harrison, Ind. He has received numerous writing awards, including three Keith L. Ware Awards from the Department of Defense.*

SP4 BOWER *is a journalist assigned to the 10th Brigade, 32nd AADCOM. A graduate of the Defense Information School, Fort Benjamin Harrison, Ind., she has been with the 32nd AADCOM since October 1981.*

SP4 FOLZ, *the staff photographer for the* 32nd AADCOM News, *is a graduate of the journalism course at the Defense Information School, Fort Benjamin Harrison, Ind. He attended mass media and communications undergraduate courses prior to joining the Army in 1980, and has a strong background in photography.*

32nd Army Air Defense Command

by Danny Johnson



The Distinctive Unit Insignia

The star, a symbol of achievement, represents the command, while the five points of the star allude to the organization's participation in World War I (St. Mihiel and Meuse-Argonne) and World War II (New Guinea and Leyte and the command's Philippine Presidential Unit Citation). The vertical arrowhead symbolizes speed and efficiency in the air, and the unsheathed sword alludes to the combat readiness and defense capabilities of the 32nd AADCOM. The areas between the arrowhead and the scroll are pierced.

The Shoulder Sleeve Insignia

The five yellow arrowheads (simulating missiles) on a red shield allude to the defense mission of the 32nd AADCOM. The placement of the arrowheads in groups of three and two refer to the organization's numerical designation.

The 32nd Army Air Defense Command was formed in January 1918 as Headquarters and Headquarters Company, 32nd Artillery Brigade (Coast Artillery Corps), at Key West Barracks, Fla., under the command of BG William C. Davis. Nine months later, the brigade sailed for France where it joined the American Expeditionary Force during World War I.

The 32nd arrived in Europe without its own equipment and had to borrow French 75mm artillery before it could take part in combat. As a field artillery organization, the unit participated in the battle for the St. Mihiel Salient, the first operation for the AEF as an independent army. The 32nd also gave supporting fire during the final offensive of World War I, the advance from the Meuse River to the Argonne Forest, and is credited for the Meuse-Argonne

Lt. Gen. Sir Maurice S. Chilton, commander in chief of the British AAA Command, salutes the colors at the 32nd AAA Brigade headquarters, Bushy Hall, England, July 7, 1954.

Campaign. After a short period of occupation duty in France, the unit returned to the United States where it was demobilized at Camp Hill, Va., in January 1919.

In October 1927, the 32nd was reconstituted in the Regular Army as an inactive unit and assigned to the Second Corps Area.

After the United States entered World War II, the 32nd Coast Artillery Brigade was reactivated, this time as a Regular Army unit at Fort Bliss, Texas, from 1942 until August 1943 when it moved to the San Francisco port of embarkation for transfer to the Pacific Theater of Operations. In the interim, the unit was redesignated the 32nd Anti-aircraft Artillery Brigade. It arrived in Australia on the ship "President Johnson."

Initially assigned to the 14th Anti-aircraft Artillery Command, the 32nd later became part of the 6th U.S. Army, which fought against the Japanese in New Guinea. In other action, the brigade took part in the landing on Leyte in the Philippines in October 1944—only an hour after the first assault troops arrived.

During the Philippine Campaign, the 32nd was credited with shooting down 249 Japanese planes, in addition to 111 probably destroyed and 129 damaged. The brigade was also credited with holding off 425 Japanese paratroopers who tried to take the Leyte airfield by airborne assault. For its part in the Leyte Campaign, the 32nd Brigade was awarded the Philippine Presidential Unit Citation. During the occupation of the Philippines after the war and before it was inactivated in May 1947, the 32nd was given the mission of training Filipino scouts.

A 32nd AADCOM Hawk missile unit crosses a pontoon bridge during a tactical evaluation exercise in 1971.

In February 1951, the 32nd was reactivated at Mildenhall, England, where it was charged with protecting U.S. Air Force bases from air attack. As part of the NATO forces, the unit became a subordinate command of the U.S. Army, Europe.

In June 1957, the brigade deployed from England and established its new headquarters in Kaiserslautern, Germany. The following year, the unit was redesignated as Headquarters and Headquarters Battery, 32nd Artillery Brigade. Before the brigade switched over to air defense missiles such as the Nike Ajax, it was equipped with 75mm and 90mm anti-aircraft guns. Then in 1964, the brigade acquired the Hawk and Nike Hercules missile systems.

In May 1966, the 32nd was redesignated as the 32nd Army Air Defense Command. Under the 32nd AADCOM are the 10th, 69th, 94th and 108th ADA Brigades, making it the largest air defense unit in the U.S. Army.

In November 1975, Headquarters Battery, 32nd AADCOM, moved from Kapun Barracks in Kaiserslautern to Cambrai-Fritsch Kaserne in Darmstadt where it is stationed today. Now a part of USAREUR and Seventh Army, the 32nd AADCOM maintains a constant watch over West Germany in support of NATO and the U.S. Army.

*

1970 photo of members of the 32nd AADCOM as they run through an operational readiness evaluation with a Hawk missile.

DANNY JOHNSON *is a management analyst for ACSI, DA, at the Pentagon. This article is one in a series he is compiling from official Army sources for Air Defense Artillery magazine.*

WHO'S NEWS

Sen. Barry Goldwater of Arizona recently paid a visit to Fort Bliss, Texas, for a briefing on the SGT York Gun and to get some hands-on experience with that weapon system, which is currently undergoing final tests at McGregor Range and north White Sands Missile Range, N.M. As a member of the Senate Armed Services Committee and chairman of the Tactical Warfare Subcommittee, Goldwater has been very supportive of the SGT York Gun program.

During his visit, he fired several 20-round bursts of target practice ammunition, bringing down two helicopter drones. The senator scored his kills while using the radar-only mode, which means he would have hit the targets even at night. ✱

The Army named ***MG Jerry Max Bunyard*** to succeed ***MG Robert L. Moore*** as commander of the U.S. Army Missile Command and Redstone Arsenal.

Bunyard has been the project manager of the Patriot missile system, with headquarters in Huntsville, Ala., since 1980. His successor in Patriot will be ***BG Donald R. Infante,*** who leaves his post as deputy commander of the 32nd AADCOM in Europe.

MG Jerry Max Bunyard will be the new Missile Command commander.

Sen. Barry Goldwater (left) emerges from the turret of the SGT York Gun after downing two helicopter drones at Fort Bliss' McGregor Range. With the senator is *John Nelson* from Ford Aerospace, the prime contractor for the SGT York Gun.

Bunyard has a broad background in weapon system management, development and testing. His 29 years of active service include two tours of duty in Vietnam and other oversea assignments in Germany and Korea. ✱

The 1st Battalion, 3rd ADA, Fort Campbell, Ky., marched through the "Windy City" in Chicago's Armed Forces Day Parade this year. The 359 volunteers were led by ***LTC Vincent J. Tedesco,*** battalion commander. The 1.7-mile parade that ran through Chicago's downtown area was the first of its kind for the air defenders. ✱

Recent NCO of the Month honors were bestowed on ***SSG Michael Ostyn*** of Battery C, 1st Battalion, 55th ADA, Fort Polk, La. Born in Stuttgart, Germany, Ostyn is currently a Chaparral squad leader and re-enlistment NCO with the 1/55 ADA. ✱

SSG Velton Locklear Jr. of Headquarters Battery, 1st ADA Training Brigade, represented Fort Bliss, Texas, at the TRADOC Drill Sergeant of the Year Competition in April. He didn't win the competition, but Locklear made significant contributions to the one-station unit training at Fort Bliss.

SSG Velton Locklear Jr. administers a PT test at the 1st ADA Training Brigade, Fort Bliss, Texas.

After serving for a year in Battery G, 4th Battalion, the brigade selected him as instructor for the Initial Entry Cadre Course in 1982. His superior performance and professionalism subsequently earned him the position of senior course manager.

"When I came into the Army in 1973, I was immediately impressed with the drill sergeants," said Locklear. "I felt that it took a special individual to successfully mold a civilian into a disciplined soldier. What finally convinced me to become one was that on my graduation from basic training, my drill sergeant told us that one day one of us would be a drill sergeant. I had an eerie feeling that he was talking about me."

*

During his off-duty hours, ***SP5 Elgin McIntyre*** has achieved a unique status. The 32nd AADCOM soldier is the only American who sings with ***Luxster,*** an otherwise all-German band. The latest word is that a German recording company is producing the group's first album, which should be released in February.

"I've been very lucky," said McIntyre, a Headquarters Battery, 69th ADA Brigade soldier attached to VII Corps at Kelly Barracks in Stuttgart, Germany. "We perform at German clubs and within the military circuit. Basically, we play in and around Stuttgart."

SP5 Elgin McIntyre: "I've been very lucky."

During a recent performance at Perkins Park, a German club, the audience reaction was wildly enthusiastic. As one listener remarked, "The whole performance can be summed up in one word: Great!"

McIntyre's future plans include flight school and appointment to warrant officer, but most of all he wants to secure his place in the entertainment world. *

When ***SSG Edward Meeks*** found and returned a lost wallet, he never expected to receive a gift for his honesty. Meeks, a Patriot launcher crewmember with the Army Materiel Test and Evaluation Directorate at White Sands Missile Range, found the wallet by the post office while visiting friends in Alamogordo, N.M.

"I looked around for anyone with a look of panic on his face," said Meeks. "I saw no one and decided to leave the wallet at the police station. It never crossed my mind again. I never expected

SSG Edward Meeks never expected to receive a gift in return for his honesty.

to come home one day and have my wife present me with a beautiful painting of the Organ Mountains."

W. A. Stevens, a southern New Mexico artist and owner of the wallet, had been to Meek's home and told his wife that he wanted them to have the painting to show his appreciation for Meek's honesty. *

Scanning

SGT York Gun Update

The first of 50 production fire control radar systems for the SGT York Gun has been delivered by the Westinghouse Aerospace Division to Ford Aerospace Corp., the gun's prime contractor.

Primarily designed to counter threats from enemy attack helicopters hovering at treeetop level, the radar can also detect and track airplanes, ground targets and missiles. The fully automatic fire control system is a derivative of the APG-66 pulse doppler radar developed for F-16 fighter aircraft. Within seconds, the radar-directed fire control system scans, detects, classifies and acquires the highest priority threat and brings the turret and guns around to engage the target.

Westinghouse's radar and fire control computer direct the SGT York's 40mm guns.

* * *

Delivery of the Hughes Aircraft Co. rangefinder for the SGT York Gun was recently made under a subcontract to Ford Aerospace Corp. The rangefinder uses a laser to pinpoint the range of helicopters and fixed-wing aircraft or ground targets. It provides accurate and almost instantaneous target range to the gun's fire control computer.

* * *

Meanwhile, the SGT York Gun has been undergoing a series of tests at Fort Bliss' McGregor Range near El Paso, Texas, by Ford Aerospace and the Army. Ford's tests primarily centered on the integrity of certain critical components

A Hughes Aircraft Co. engineer tests a laser rangefinder developed for the SGT York Gun. (Photo courtesy of Hughes Aircraft Co.)

linked to the twin 40mm Swedish Bofors automatic cannons. Included in the tests were the first production model of the new turret which is considerably lighter than the original prototype and the minor improvements made in the software, particularly those related to electronic countermeasures.

The Army's testing is being conducted in two phases—developmental and operational. Developmental tests will insure that, prior to production, previous problems with the SGT York Gun will have been corrected. The Army is looking for increased hit-kill probabilities against fixed-wing aircraft, integration of the IFF system, improved system performance in an electronic countermeasure environment and overall reliability of major subsystems.

During the operational phase of testing, the Army will gather data on detection, tracking and simulated engagement of multiple, simultaneous ground and aerial targets in an electronic countermeasure and NBC environment. The SGT York Gun's response to anti-radiation missile threats and its performance against stationary and moving ground targets in a live-fire exercise will also be examined.

The latest test series continue at McGregor Range near El Paso, Texas. The radars are not erected or operating since firing is in support of armament subsystems analysis only.

The first production system will be released to the government in September, with the first SGT York Gun scheduled for delivery to Fort Bliss for training purposes in late 1983.

Guard To Get Improved Vulcan

In September 1982, a contract was awarded to Lockheed Electronics Corp. to modify self-propelled Vulcans as they are displaced by the fielding of the SGT York Air Defense Gun System. The ultimate destination for the Product Improved Vulcan Air Defense System (PIVADS) is the Army National Guard where it will replace the M-42 "Duster."

Modifications to the basic Vulcan include:

- replacing the disturbed line of sight currently used with a director sight. The change will give a rate-aided tracking capability, thus reducing the gunner's job of tracking to that of making minor adjustments with the hand controls.
- linking a digital fire control computer to the range-only radar for more accurate lead and superelevation commands to the gun barrels.
- modifying the direct support test equipment (TSM-115) to accept printed circuit board cards.
- giving the electronic quality automatic test equipment used at general support and depot level the capability to accept PIVADS printed circuit board cards.

Although there are no changes planned for the 20mm ammunition currently used on the Vulcan, there are various proposals to improve the kill probability by modifying the ammunition to extend its range.

Operational testing for PIVADS is scheduled for early 1984 with a production decision to follow shortly after.

The time lapse between the release of the Vulcan from its active Army role and its issue to the Army National Guard is expected to be six to nine months, depending on shipping time from overseas to Red River Army Depot in Texarkana, Texas, where the modifications will be made.

Non-nuclear ABM To Be Studied

The Army is studying advanced technology to destroy nuclear-armed Soviet re-entry vehicles within the atmosphere with non-nuclear warheads. To do so, it will flight test a small, experimental, single-stage, hypersonic missile interceptor developed by Vought Corp.

In January, the Army awarded Vought an approximate $70-million, 30-month contract to develop and flight test a small radar-homing intercept missile. Flight testing is scheduled to begin within 18 months at White Sands Missile Range, N.M. The targets used are expected to be a variety of air-launched missiles, ground-launched rockets and artillery that will simulate Soviet re-entry vehicles.

The missile, which is 9 inches in diameter and 9 feet long, is designed to spin slowly en route to the target, using more than 100 small solid-rocket motors for vector control and stability. The single-stage interceptor is shaped more like a tactical missile than earlier cone-shaped interceptors such as the Sprint.

The experimental missile program is structured to validate integrated components, and determine accuracy and miss distances.

Developments

Request Emphasizes Laser Technology

The Department of Defense laser technology progams are approaching the stage where realistic tests are being planned for the next several years. The programs are based on demonstrating practical verification of lethality, technology base expansion and scaling the technology to support prototype systems. Thus, the Defense Advanced Research Projects Agency's (DARPA) budget request of $867.7 million for FY84 reflects DoD's emphasis on laser technology development and includes:

- Army—$50.4 million, up from $44.4 million in FY83. The FY85 budget plans for $78.1.
- Air Force—$133.8 million, up from $102.5 million in FY83. The FY85 budget plans for $126.7 million.
- Navy—$75.3 million, an approximate $10-million increase from FY83. The FY85 budget plans for $78.1 million.
- DARPA—$172.6 million, up from $128.8 million in FY83. The FY85 budget plans for $200.5 million.
- Laser Test Range—$36.9 million, a $30-million increase from FY83. The FY85 budget plans for $40 million.

The overall laser funding by DoD includes the Air Force's Airborne Laser Laboratory, the Navy's Sea Lite laser test series at the National High-Energy Laser Test Range and the Army's demonstration of a close combat laser weapon.

A joint Army, Air Force, DARPA program will examine space-related military laser applications. The DARPA program includes the Alpha chemical laser device to test laser beams for power levels and beam quality, the large optics demonstration experiment to demonstrate beam control and project Talon Gold to test, in space, acquisition, tracking and precision pointing. A short-wavelength laser program is also included in the funding request.

Another DARPA effort is the investigation of particle-beam weapons. And finally, the submarine laser communications program, a joint Navy/DARPA effort, will develop the technology of blue-green laser transmitters which can penetrate the ocean to communicate with submarines at operating depths.

Army Procures Radar Camouflage

Trade publications have been giving increased attention to Soviet interest in camouflage, which they call *Maskirovka*. Now, according to a recently released report from Department of Defense, the United States is also active in providing radar camouflage for its troops.

The report announced the award of a $22.5-million contract for large quantities of radar scattering and screening systems of types to be used in both desert and wooded terrain.

Production Of AH-64 Helicopter Begins

Assembly operations for the Army's new AH-64A Apache attack helicopter got underway recently with the arrival of the first production fuselage at Hughes Aircraft Corp. assembly and flight test center in Arizona.

The first production Apache is scheduled to fly before the end of the year and will be delivered next February. The Army plans to buy 515 AH-64s through 1989.

Yuma Tests ELKE Weapon Concept

A prototype test-bed vehicle called the elevated kinetic energy (ELKE) weapon is being tested at Yuma Proving Ground, Ariz.

The weapon, a 75mm automatic, hyper-kinetic energy gun which can fire both high-explosive and armor-penetrating sabot rounds, is a concept that will probably never appear "as is" in the Army's inventory, but is being evaluated as a new technology item with future applications.

The ELKE differs from current tank design by not having a full turret, but having a rotation mechanism under the gun mount. The cannon is mounted on the vehicle, an M-551 Sheridan chassis, with a hydraulic system or trunnion. Current tanks have the main guns mounted in a revolving turret which stands above the tank hull.

Initial testing, begun in October 1982, showed that the hull and three-man crew compartment can be safely hidden from hostile fire behind walls and other covers while the gun trunnion can be raised 18 inches and the tube depressed a full 25 degrees.

The ELKE test bed was developed by Pacific Car and Foundry Co., Renton, Wash., in conjunction with the Tank-Automotive Command of Warren, Mich., as a concept test item which calls for a relatively lightweight, highly mobile, moderately armored vehicle of less than 20 tons which would be capable of defeating light and

medium tanks, as well as fighting vehicles and armored personnel carriers.

(Photo by Filemon Tellez)

Copperhead Is Alive And Well

After much debate following an apparent Army decision to prematurely terminate the Copperhead artillery projectile program, a budget compromise was reached by the Army and the Department of Defense that will continue the production of the Copperhead until 1990.

The Copperhead is a precision laser-guided projectile which is fired from 155mm howitzers. Because of the precision guidance, it gives artillery the capability to destroy hard point targets up to 16 kilometers away.

A year ago, Copperhead experienced production problems and failed to reach an 80-percent reliability goal. Consequently, the production program was cancelled for FY83 and beyond.

A reliability enhancement program was initiated and, according to officials, realized immediate results. Because of minor design changes, production process improvements and quality assurance efforts, Copperhead has met all mission requirements, including reliability, since July 1982. Current high reliability scores have far exceeded expectations.

AH-1S Cobra To Undergo Modifications

An advanced development program for the AH-1S Cobra attack helicopter will be conducted by Bell Helicopter Textron under a 14-month, $1.5 million U.S. Army Aviation Research and Development Command contract.

The contract calls for advanced development of the survivability and vulnerability improvement modifications program that includes fuel tank fire suppression systems, aircrew crash energy-absorbing armored seats and engine armor modification. The modifications are for anticipated follow-on engineering development and integration into the Cobra aircraft block improvement program. *(AVRADCOM)*

Communications Jammer Tests Successful

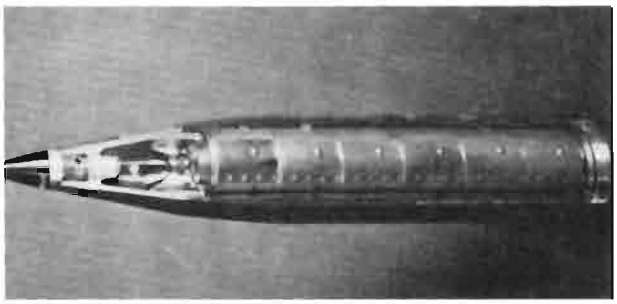
Successful engineering tests were conducted recently on the artillery-delivered expendable communications jammer. Developed by the Army Electronics Research and Development Command's Signals Warfare Laboratory, the jammer was found to be gun-rugged and safe to fire.

During tests at Yuma Proving Ground, Ariz., jammers were loaded into 155mm cargo rounds and fired from howitzers at various ranges. During flight, the base plate of the round is blown off, and the jammers are ejected from the round one at a time according to preset times.

As the jammers, or pucks, clear the projectile, de-spin fins are deployed by centrifugal force and a streamer is released. The fins de-spin the jammer while the streamer provides a righting force to orient the puck which impacts at a velocity of about 130 feet per second and imbeds itself one to three inches into the ground at the proper angle. The antenna is then deployed and within seconds the transmitter turns on and jamming begins.

The jammers are less susceptible to detection than those now in the field and are much less expensive to produce.

The next series of tests will involve 1,000 jammer units in formal developmental and operational tests to take place late in FY84. *(RD&A)*



'New-Look' Chinooks Delivered

Delivery of the first newly modernized Boeing CH-47 Chinook helicopter was recently made to the 159th Aviation Battalion, 101st Airborne Division (Air Assault). By early 1984, the 159th is scheduled to form the Army's first CH-47D company.

During the Chinook's modernization process, which was done at the Boeing-Vertol factories in Philadelphia, the aircraft was stripped to its frame and rebuilt using state-of-the-art technology, including new, more powerful engines, improved avionics, triple cargo hooks and night-vision goggle capability. The result is a helicopter, the CH-47D, which can lift twice the payload under the same conditions as the CH-47A. *(ARNews)*

Career

Military Leadership FM Coming

The coordinating draft of FM 22-100, Military Leadership, has been printed. Approximately 3,000 copies will be distributed for Armywide staffing and review.

Barring any major changes in approach, content or style, final publication is scheduled for September 1983.

First Sergeant Course Opens Branch

To meet the Army's growing demand for fully trained first sergeants, the U.S. Army Sergeants Major Academy opened its first branch of the U.S. Army First Sergeant Course in Munich, Germany.

With the exception of one additional week of Europe-unique topics, the curriculum is the same as its CONUS parent located at Fort Bliss, Texas. The course is eight weeks long and its student body is made up of Army personnel in grades E-7 and E-8.

Students are selected to attend the First Sergent Course by their respective major Army commands, contingent on space allocations from Department of the Army.

ADA Warrant Officer Vacancies

The Army is seeking qualified applicants to fill projected vacancies in 49 of the 62 warrant officer specialties. Applications will be accepted until the end of the fiscal year.

Air defense-related specialties open to applicants are: 201A, 211A, 214E, 214G, 224B, 271A.

Details on application procedures and preferred qualifications can be found in DA Circular 601-82-13, Warrant Officer Procurement Program—FY83.

Europe Joins College Program

The Servicemembers Opportunity Colleges Associate Degree (SOCAD) program has expanded to U.S. Army, Europe.

The SOCAD concept allows soldiers to earn non-traditional credits for skills and knowledge gained in the military. Following recommendations from the American Council on Education, participating schools form a network which subscribes to identical associate degree requirements. A school within the network agrees to award a diploma whenever a soldier completes the requirements regardless of the institution or location where he meets them, so long as he has met a minimum residency requirement.

For more information, contact any education counseling center or write Servicemembers Opportunity Colleges, Suite 700, One Dupont Circle, Washington, DC 20036. *(ARNews)*

Remedial Education Policy Recommended

A review of attrition rates in the Non-commissioned Officer Education System (NCOES) has determined that a significant part of the problem is a weakness in basic educational skills. Thus, the need to improve basic and advanced educational skills has been recognized as a critical issue affecting the NCO corps.

As a result of a FORSCOM Education in Support of Training Conference, policy recommendations concerning direction and guidance for the integration of the Army Continuing Education System in support of NCOES were submitted to Department of the Army. Such policy initiatives concerning remedial education programs will ultimately provide education and MOS competency training that will improve NCO performance in NCOES as well as on the job.

Belvoir Offers First Non-resident Course

The Defense Systems Management College, Fort Belvoir, Va., is offering an extension version of its popular Contractor Performance Measurement (CPM) Course. The course, designed to provide students with an understanding of the way progress is evaluated in a defense acquisition program, is open to military officers and equivalent-grade civilians.

The CPM extension course is a do-it-yourself version of the CPM resident course. It is presented in 11 easy-to-read, informal modules that allow the student to proceed at his or her own pace. Students who successfully complete the course will be awarded a Defense Systems Management College Certificate of Completion.

There is no fee for military or government civilian personnel. However, there is a $50 fee for industry and part-time government personnel.

For more information and registration forms, contact the Registrar, CPM Extension Course, Defense Systems Management College, Fort Belvoir, VA 22060; AV 354-1054.

Graduate Education Opportunity

The Florida Institute of Technology has initiated a master of science program in operations research at the U.S. Army Logistics Manage-

ment Center, Fort Lee, Va. Officers who desire to pursue the degree must first complete the 12-week Operations Research Systems Analysis Military Applications Course I for which they receive six graduate quarter credit hours with the institute. The remaining 42 credit hours are completed within one year for a total time of 15 months at Fort Lee.

The degree program is a cooperative program requiring student officers to pay tuition costs. However, VA educational benefits can be used for tuition payment.

For program information, contact William Creed, resident director, U.S. Army Logistics Management Center, FIT Office, Fort Lee, VA 23801; AV 687-2722 or Jose Antunes, ORSA Committee, U.S. Army Logistics Management Center, ATTN: DRXMC-LS-S, Fort Lee, VA 23801; AV 687-2386.

Interested officers with degrees in science, engineering or mathematics are encouraged to discuss the program with their respective professional branches at MILPERCEN.

Army Seeks Soldiers For EOD Duty

The Army wants enlisted volunteers, preferably in the grades of E-1 to E-4, for explosive ordnance disposal (EOD) duty at installations in the United States and overseas.

To be eligible, volunteers must have 13 months left in service after training is completed, or must extend or re-enlist to meet the requirements before leaving their current unit.

Those selected will be attached to an EOD detachment on their current installation before attending a two-week course at Redstone Arsenal, Ala., followed by a 13-week course at the U.S. Navy Explosive Ordnance School at Indianhead, Md. Soldiers who complete both phases will be awarded MOS 55D10 and become eligible for special demolition pay.

Interested soldiers who meet the prerequisites for EOD duty as outlined in applicable Army regulations, may forward their application to: Commander, MILPERCEN, ATTN: DAPC-EPT-F, 2641 Eisenhower Avenue, Alexandria, VA 22331. *(ARNews)*

Army Needs Enlisted Aides

There are worldwide enlisted aide vacancies to which only volunteers are assigned. Aides perform official duties for certain general officers, and serve a necessary military purpose. Additional information concerning the program can be found in Chapter 8, AR 614-200.

Interested NCOs in grades E-5 through E-9 are encouraged to write the Enlisted Aides Assignment Managers, U.S. Army Military Personnel Center, ATTN: DAPC-EPX-E, 2461 Eisenhower Avenue, Alexandria, VA 22314, or call AV 221-8389 or 8399.

Selective Re-enlistment Bonuses Announced

Re-enlistment bonus money is now available to soldiers in 94 MOSs. Of those, 88 are open to soldiers who re-enlist in a bonus MOS between the 21st month and sixth year of service; 62 are open to eligible soldiers who re-enlist between their sixth and 10th year of service; while 13 are open to re-enlisting soldiers in their 11th to 14th year of service.

Selective re-enlistment bonuses are calculated by multiplying the enlisted member's monthly basic pay by the number of years of additional obligated service by the multiplier authorized for the MOS.

The following are air defense-related MOSs on the roster:

MOS	Description	Multiplier
16J	Defense Acquisition Radar Operator (with SQI "P")	SRB-1A, 1B SRB-2A, 2B
16P	Chaparral Crewman	SRB-1A
16R	Vulcan Crewman (with SQI "P")	SRB-1A, 1B SRB-2A, 2B
16S	Redeye/Stinger Crewman (with SQI "P")	SRB-1A SRB-2A
16T	Patriot Missile Crewmember	SRB-1A, 1B
24M	Vulcan System Mechanic	SRB-2A, 2B
24N	Chaparral System Mechanic	SRB-1B
24T	Patriot System Mechanic	SRB-2A, 1B
25L	AN/TSQ-73 Operator/Repairer	SRB-2B
27G	Chaparral/Redeye Repairer	SRB-2B
27N	FAAR Repairer	SRB-1A, 1B

Correct Method To Request OMPF

Improperly prepared requests for Official Military Personnel Files are on the increase, say officials at the Enlisted Records and Evaluation Center at Fort Benjamin Harrison, Ind. Too many soldiers are submitting their requests without signatures or full social security number.

The proper way to request an OMPF is on standard size paper on which the full name, grade, complete social security number, mailing address and signature must be recorded. Requests not containing the proper information will not be processed.

Requests should be addressed to Commander, USAEREC, ATTN: PCRE-RF-I, Fort Benjamin Harrison, IN 46249. (MILPO)

Communiqué

Vietnam Era Literature Needed

Pig Iron Press, a non-profit literary publisher funded by private donations and grant support from the Ohio Arts Council, invites writers, journalists, photographers and artists to submit material for a special Vietnam Era anthology to be published in December 1983.

Non-fiction and fiction articles, poetry, photography and drawings are solicited. The editors are looking for a variety of perspectives and viewpoints from the Vietnam war period, with particular emphasis on the point of view of the American soldier in Southeast Asia. Photographs in any format, from Polaroid snapshots to professional prints, can be submitted.

Upon publication, contributors will receive $2 per poem, photograph or published page and two copies of the anthology. All submissions will be returned if a stamped, self-addressed envelope is included.

Deadline for submissions is Sept. 1, 1983. Send to: Pig Iron Press, P.O. Box 237, Youngstown, OH 44501.

Proving Citizenship Easier

Servicemembers whose children were born outside the United States are no longer required to obtain a Certificate of Citizenship (Form N600) from the U.S. Immigration and Naturalization Service to document their status.

Recent legislation permits the presentation of either an unexpired valid U.S. passport or a Report of Birth Abroad of a Citizen of the United States (FS-240) as conclusive proof of U.S. citizenship.

The change in legislation is retroactive (indefinitely) and affects mostly those service personnel whose children were born in either U.S. military hospitals or civilian hospitals overseas. Eliminating the requirement to obtain the Certificate of Citizenship makes citizenship status easier to document and prove, but it also increases the importance of reporting a birth of a child overseas to the nearest U.S. consulate office.

For further information on the citizenship process, contact your local personnel office. *(AFPS)*

Bringing Humans, Computers Closer Together

If you're a "high technik" with an appreciation for the human side of things, you can indulge that side by getting a copy of "Human Engineering Guidelines for Management Information Systems."

That's the title of a new book offered free to those who request it and published by the U.S. Army Human Engineering Laboratory at Aberdeen Proving Ground, Md.

It contains 10 chapters, a glossary and an index. Its contents are based on field research of common system problems and give results of an extensive literature search of human-computer relationships in such areas as psychology, computer science and engineering.

Among its topics are a model of the system design process, principles for improving communication between user and computer, guidance on effective training programs and a look at office environment factors affecting efficiency, productivity and worker morale.

For a copy of the book, write to Daniel E. Hendricks, U.S. Army Human Engineering Laboratory, Aberdeen Proving Ground, MD 21005; AV 283-2625 or commercial (301) 278-4550. *(ARNews)*

Army Tests New ID Card

A new kind of ID card is being tested at Fort Lee, Va., which will bring IDs into the computer age.

Department of Defense officials say that the new test card, made from polyester or polyvinyl chloride, will include information embossed on the card and contained on either a computer chip or magnetic tape strip.

The test, known as the Rapids Project, is being conducted to establish control over the issuance of ID cards and to develop a tamper-resistant card. *(ARNews)*

Camouflage Jacket Now Available

The new cold-weather camouflage coat, better known as the field jacket, is now available and authorized for wear. The jacket made its appearance in the Army's supply system in March and became available in clothing sales stores in April. The price has been set at $35.70 each.

Enlisted personnel who were in the Army before the new coat made its debut are required to buy their first camouflage coat by March 1, 1984. The second coat will be required by March 1, 1986. However, the green field jacket will continue to be authorized for wear until March 1, 1986.

The Army tested the new coat to make certain that it would not shrink too much when laundered and it received a clean bill of health. Offi-

cials see no problem with shrinkage, if instructions on washing and drying are carefully followed.

BDU—A Hot Issue

Reports of the battle dress uniform (BDU) being particularly susceptible to burning are false, according to officials at the Army Material Development and Readiness Command (DARCOM) where special flammable tests were conducted on the BDU.

Well-intentioned commentaries published in several military publications have recounted an event in which a soldier, attempting to remove loose threads from a uniform, held a flame to the uniform while it hung vertically from a hanger. The uniform caught fire.

Some articles said that the BDU fabric was very susceptible to burning, but Army specifications require that the BDU be made of materials that will not propagate flame at a rate greater than the all-cotton, standard hot-weather combat uniform.

Even so, DARCOM instructed its Natick Research and Development Laboratories to conduct burn tests on the BDU involved in the incident, other BDU fabric and other military and commercial uniforms. The results and conclusions were that the current BDU fabric was the most fire-resistant of all work materials tested. Under the controlled test, the old jungle fatigue fabric burned twice as fast, and the old durable-press fabric about one-and-a-half times as fast as the new BDU fabric. Even a common cotton-polyester blend like that used for civilian work clothes burned considerably faster than the fabric blend of the BDU.

Officials stressed, in summary, that the BDU is not designed to be flame resistant, nor is any other standard uniform. Use of a flame to remove loose threads is definitely a safety hazard.

Army Aviation Becomes A Branch

Secretary of the Army John O. Marsh Jr. announced in April the establishment of aviation as a separate branch of the Army. Additionally, Army Chief of Staff E. C. Meyer approved the centralization of proponency for aviation matters at the Army's Aviation Center at Fort Rucker, Ala.

The two actions are a result of a thorough study of the Army's aviation requirements now and in the future. New battle doctrine developments which broadened aviation's role as a combat maneuver element and personnel management considerations, according to Meyer, made formation of a separate aviation branch necessary.

The decision will not change the fundamental nature of Army aviation and its mission, nor does it affect the close air support mission of the Air Force. The combined effect of the two decisions will be "the full integration of Army aviation into the combined arms team." *(ARNews)*

Attention Married Soldier-Couples

Army officials say that since the start of a new program in which all married Army couples can automatically be considered for same assignments, less than half of the known 15,000 married soldier-couples have applied under the new procedures.

Known as the Joint Domicile Program, the new policy eliminates the need for a soldier to apply for a joint domicile each time his or her spouse receives reassignment orders.

Since increasingly more women have been entering the Army, married Army couples—one Army soldier married to another—have become commonplace. As a result, Army policy has been to assign soldier-couples to locations where they can establish a common household whenever possible, while still addressing assignment policies and the Army's needs.

For more information about the program, see Page 48 of the Air Defense Artillery magazine's Winter 1983 issue, or talk to your local military personnel officer.

Intelligence

British Developing New SAM

The British army is developing a new shoulder-launched, surface-to-air missile code named the Javelin. The new missile will incorporate lessons learned in the Falkland Islands conflict, including the need for automated guidance capability for low-visibility conditions and increased range.

India Fires Over-wing Missiles

Indian air force Sepacat Jaguars have successfully fired Matra R-550 Magic missiles installed on their upper wing surfaces. Other than the United Kingdom and France, India is the only country to successfully integrate a sophisticated air-to-air missile on the over-wing pylon of a fighter aircraft.

According to Indian press reports, the installation of the missiles has tremendous implications, especially in increasing the Jaguar's capabilities.

With the delivery of the final two of 40 new-production Jaguars late in 1982, the build-up of the Indian air force's Jaguar force is gaining momentum. Three squadrons are operational, and a fourth squadron is scheduled for activation this year.

France Bench-tests New Missile

The first integration test-firing of the French Rustique surface-to-air missile successfully occurred at Saint Medard en Jalles, France. The term integration means that, for the first time, the firing of the solid-fuel booster was followed by the ignition of the cruise ramjet.

Rustique, which reportedly is intended to succeed the Roland Euromissile, will have a range of nine to 12 miles. The first flight test of the new missile is scheduled to take place this year. *(IDR)*

NATO To Acquire AEGIS System

An airborne early warning ground integration segment (AEGIS) system being produced under a $285 million NATO award is expected to become operational at 42 NATO sites by the mid 1980s. The AEGIS system will relay radar information from AWACS aircraft for review by commanders at NATO ground stations. The system was designed primarily to alert NATO's air defense network to aircraft flying below the radar horizon of ground-based surveillance radars.

One important element of the AEGIS program is the use of the joint tactical information distribution system which will provide anti-jam and secure communications links between the AWACS aircraft and the ground centers.

British Launch Vertical Seawolf

The first vertical launch of an operational version of the British Aerospace Seawolf missile took place at Larkhill, England. A booster motor has been added to the missile to facilitate vertical launch and to turn the missile onto its interception path, clear of a ship's superstructure.

British Aerospace Dynamics Group at Bristol is developing the lightweight, vertical launch Seawolf for new British Royal Navy frigates. *(AW&ST)*

Japan To Get Nike-J Parts

Japan's Air Self Defense Force has received notification that orders for replacement parts for the McDonnell Douglas/Mitsubishi Nike-J surface-to-air missile received this year will be filled in 1985. No request will be accepted after 1986. Japan is planning to purchase from the United States a $17.5 million block of replacement parts for their missiles. The Japanese service predicts the parts will keep its six Nike-J groups in service for 10 more years.

Singapore Wants Hawkeyes, Missiles

Grumman Aerospace Corp. has reportedly obtained U.S. State Department clearance to offer the Republic of Singapore air force a simplified export version of the E-2C Hawkeye referred to as the E-2X. Reports are that Singapore will procure two aircraft.

Countries that have purchased Hawkeyes are Israel, which claims to have used the aircraft against the Syrian forces in the Lebanon conflict, the Japanese defense forces, which will have four E-2Cs guarding their vital airspace and sealanes, and the Egyptians, who have chosen to add four Hawkeyes to their arsenal.

Among other countries reported to be interested in acquiring the E-2Cs are Australia, Korea, Venezuela, Greece and France.

In another action, Singapore is buying an undisclosed number of Improved Hawk missiles plus 200 air-to-surface Maverick missiles for its 32 A-4 ground attack planes. The A-4 is standard to the air forces of Singapore, Malaysia, Thailand and Indonesia. Singapore, however, has expressed an interest in the F-16A and has been offered the Mirage 2000 by France.

The new missiles and the E-2Cs would make the Singapore air force one of the most modern in Asia. Singapore is expected to receive the missiles later this year.

Foreign Arms Sales Proposed

The Department of Defense has notified Congress of a proposal to sell anti-tank helicopters to Greece, air defense missiles to Norway and aircraft-identification equipment to Saudi Arabia.

Greece wants to buy eight AH-1S Cobra helicopters, including spares and test and support equipment, at a cost of $66 million. They would be used for anti-tank defense.

The proposal for Norway involves 30 Improved Hawks and the overhaul of 18 high-powered illuminator radar units, 54 launchers, 24 loaders and associated support equipment at an estimated cost of $61 million. The proposal says that Norway needs the missiles for defense of their F-16 airfields.

Saudi Arabia has requested purchase of 762 IFF systems. Including support and maintenance, the cost is estimated at $149 million. The purchase involves 364 systems for the Saudi air force, 329 for the land forces and 69 for the navy. *(AW&ST)*

United Arab Emirates Buys I-Hawk

The United Arab Emirates recently agreed to buy several Improved Hawk missile systems from the U.S. government. The procurement action, which does not cover the cost of training and support, is reported to be valued at $500 million. It is the first U.S. missile system purchased by that country.

Roughly the size of Maine, the United Arab Emirates is located on the south shore of the Persian Gulf, neighboring Qatar, Saudi Arabia and Oman.

Different from the system used by the U.S. Army, the Hawks earmarked for the United Arab Emirates will be tailored to fit its particular requirements.

According to Pentagon sources, the procurement package will include five I-Hawk TRIAD batteries. The first shipment of the missile system is expected in early 1986.

More Hinds for Latin America?

Reports are that two more Latin American countries, one of which is Chile, are likely to order small quantities of Mi-24 Hinds from the Soviet Union. This is in addition to Peru, which has already bought 10 Hind-Ds.

Although European manufacturers are marketing their helicopters in many Latin American countries, orders of Soviet equipment are expected.

Jordan, South Korea Want F-20A

Following a Joint Military Commission meeting between Jordan and the United States, it is now anticipated that the Royal Jordanian Air Force will be the first customer for the F-20A Tigershark with an order for 36 to 40 aircraft. Procurement is expected to be funded by the United Arab Emirates, Saudi Arabia and some U.S. foreign military sales credits.

Discussions are also in progress with South Korea concerning the possible procurement of the Tigershark for its air force. Interest has been expressed in acquiring 60 to 80 aircraft, with possible indigenous parts manufacture and final assembly. F-5E and F-5F Tiger IIs are currently being produced in South Korea. *(Air International)*

Soviets Show New SA-8 Launcher

A new Soviet six-round SA-8 Gecko box launcher made an appearance during a late 1982 parade in Moscow. Previous SA-8 systems had four missiles mounted on launch rails. The bar extending upward from the bottom of the surveillance radar is thought to be an IFF antenna.

German Firm Develops Revolutionary Rifle

A new rifle that fires caseless ammunition has been developed by a West German firm. The rifle, which has been approved in principle as the future weapon of the West German army, is 30 inches long and weighs approximately nine pounds when fully loaded.

Called the G-II, the new rifle has some unique characteristics due to its caseless ammunition; it requires no case ejection system, its dimensions are smaller and its operation does not consume expensive metals. Because the ammunition is caseless, cartridges can be packed closer together than in standard ammunition magazines, saving space and avoiding many firing malfunctions because of friction.

The ammunition is supplied in packs of 59 rounds and is loaded directly into the weapon by a special loading device located behind the grip. The bullet, which weighs 3.4 grams (approximately 55 grains), has a flat trajectory up to 300 meters and can penetrate a standard German steel helmet at 600 meters.

There are no external moving parts on the G-II. All moving parts of the weapon are enclosed in a sealed receiver to protect them. This means that the weapon can operate in all climatic conditions and after immersion in water, including sea water, sand or mud. The rifle can be fired easily from the shoulder or hip in an automatically limited three-round burst that corresponds to the degree of normal aiming error encountered in combat situations.

Troop trials with the G-II will take place in 1984, and series production will begin in 1985. *(Pacific Defence Reporter)*

Taiwan Computerizes Deployment System

Using computerized information management technology, the army of Nationalist China has successfully developed an anti-aircraft gun deployment system.

The anti-aircraft system, independently developed by the defense ministry, is capable of choosing and deploying missiles, anti-aircraft guns, airplanes and other weapons best suited to a particular situation to gain maximum effect in air defense. *(Chung Kuo Shih Pao)*

China To Buy French Mirages

Proposed acquisition of Mirage 2000 fighter aircraft by the People's Republic of China has been approved in principle by the French government. French officials say the sale could take one to three years to finalize.

The quantity of aircraft and delivery schedules will be established as negotiations between France and China advance.

Mirage 2000s have been sold to the French air force and three export customers; India has ordered 40, Egypt has purchased 20 and Peru has ordered 20.

U.S. Firm Gets Australian Contract

The Department of Defense of the Commonwealth of Australia has awarded an approximate $18 million contract to Sanders Associates, Inc. to provide an electronic support measures subsystem for the Royal Australian Army.

The subsystem will intercept and locate the position of combat radio transmissions. The equipment is reported to feature the latest technology in electronic warfare and is being built to withstand the harsh climatic conditions encountered in some regions of Australia.

Pakistan Buys F-16 and Mirage

The first six of 32 F-16As and eight F-16Bs have been delivered to the Pakistani air force, which plans to have its first F-16 squadron operational by early 1984. The last aircraft is due for delivery in September 1985.

The Pakistani buy, which includes spares, ground support equipment and personnel training, is valued at some $1.1 billion.

In another procurement action, 30 single-seat Mirage 50s currently are being delivered to the Pakistani air force.

Belgium Won't Buy Patriot

The Belgian government has informed NATO that budgetary constraints have forced it to abandon plans to buy the Patriot air defense system. Officials further indicated that the Brussels government would like to return to Belgium some of its Hawk missiles now deployed in West Germany. These announcements will cause NATO to review Belgium's role in the total air defense system.

The Belgian Defense Ministry also announced it will dismantle two of its eight Nike Hercules bases in West Germany. One of the sites, at Kaster, is being abandoned. The other, at Erle, north of Dusseldorf, is being moved.

Australia Buys 'Firefinder' Radar

Australia has awarded Hughes Aircraft Co. a multimillion-dollar contract to build seven weapon-locating radar systems that can pinpoint the position of enemy mortars, and artillery and rocket launchers.

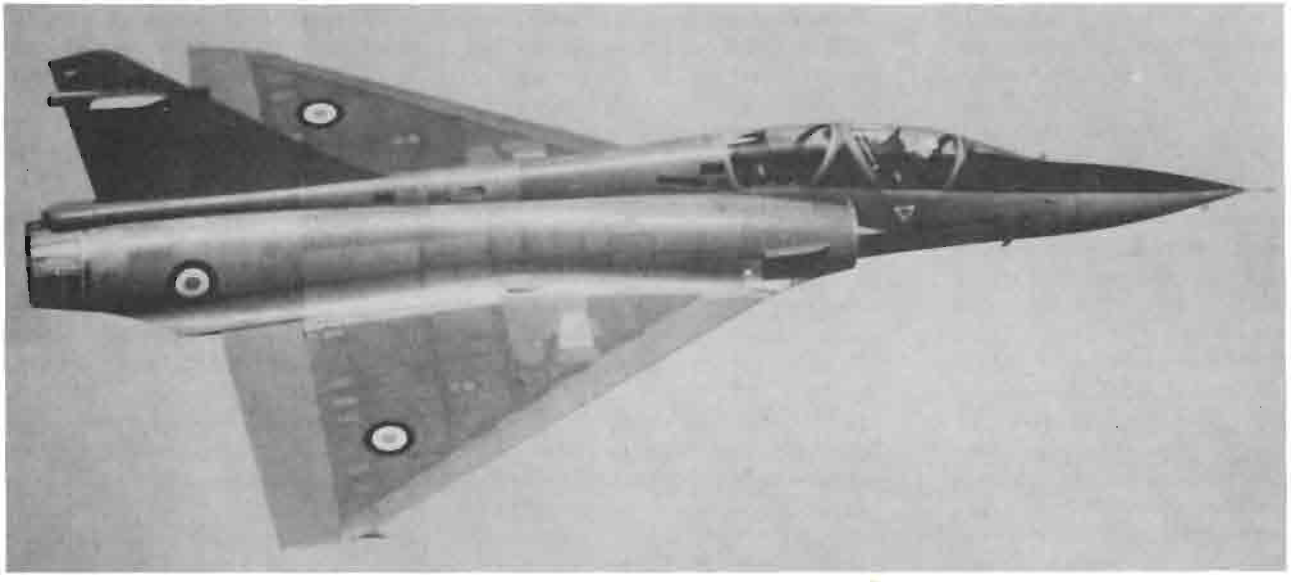
The mobile Firefinder system, designated AN/TPQ-36, can rapidly scan the horizon with a pencil-thin beam, forming an electronic curtain across the battlefield area. Thus, the system, deployed a few miles behind a battle line, can detect and track several incoming projectiles simultaneously and, within seconds, can automatically determine where each weapon is located. This information is displayed on a battle map console housed in a nearby control center operated by a single soldier. The information is then rapidly relayed to friendly counterfire units.

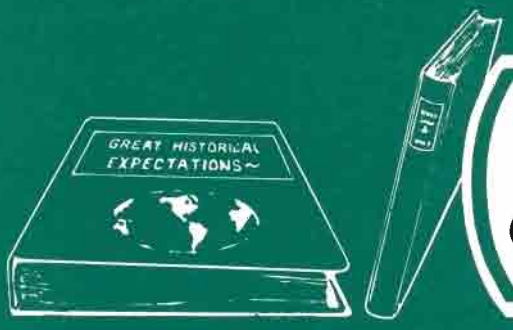
In addition to Australia, countries that have ordered Firefinder radars include the United States, the Netherlands, Saudi Arabia, Jordan and Thailand.

Soldiers install a Firefinder radar. Installation can be accomplished within minutes. (Photo courtesy of Hughes Aircraft Co.)

France Tests Nuclear-attack Mirages

The first nuclear-attack version of the French air force Mirage 2000 is undergoing flight tests. The new aircraft, a two-seat version of the basic Mirage 2000, incorporates a terrain-following avionics package for low-altitude, high-speed penetration. Each Mirage 2000N will carry a single Aerospatiale ASMP supersonic missile with a thermonuclear warhead.





BOOKS

THE WAR MAGICIAN
by David Fisher
Coward-McCann Publishers, New York, 1983. 315 pages. $16.95.

Many people may not be aware of the vital role that camouflage and deception played in the conduct of the North African desert campaign in World War II. Both sides disguised armored vehicles, artillery and supply locations in an attempt to deceive the enemy and conceal actual strengths and locations. It is fitting that the British camouflage effort fell into the deft hands of Jasper Maskelyne, one of Britain's leading prewar stage magicians.

At the outbreak of World War II, Maskelyne was determined to turn his magical skills and knowledge of deception against the Axis powers. Even allowing for his age (late 30s), few military people were ready to take him seriously.

A combination of the threat of a German invasion plus Maskelyne's persistence resulted in his commissioning and assignment to a newly formed unit—the Royal Engineers Camouflage Training and Development Centre. Maskelyne maintained that many stage magic techniques could be applied successfully to battlefield camouflage and took every opportunity to demonstrate his convictions in his classroom assignments. Many of the industrial and prime target camouflage efforts during the "pretend war" were designed under his supervision.

Operating from a site on the outskirts of Cairo, dubbed the "magic valley," Maskelyne's unit (referred to as the Magic Gang) set about creating some of the most unique and effective battlefield illusions of the war.

Among his more significant contributions were: creating lightweight and collapsible frames for trucks and tanks to disguise them as the other; "moving" the harbor of Alexandria, Egypt, so that German bombs fell harmlessly into the desert and creating a dummy battleship and dummy submarines to confuse German intelligence estimates.

Rather than a sterile, dry history of Maskelyne and his Magic Gang, this book is more like a novel, embellishing some of the characterizations, while retaining a historical perspective. Fisher gives us more than a brief sketch of each of the personalities involved. With Maskelyne's reputation for significant contributions in the art of escape and evasion, one would expect to see more detail of his inventions in that area. Regardless, *The War Magician,* through a mix of careful battlefield detail and personal insight into the major characters, succeeds in fulfilling either the technical or casual reader's interest.

—MAJ Richard Narushoff

TRACKS OF THE BEAR. Soviet Imprints in the Seventies
by Edgar O'Ballance
Presidio Press, Novato, Calif., 1982. 286 pages. $14.95.

"Western leaders have long been mesmerized into believing that Soviet leaders think and react much as they themselves do, are primarily concerned with good government and cordial relations between nations and, above all, will do almost anything to avoid a third world war.

"Regarding Soviet statesmen as replicas of their Western counterparts has become known as 'mirror-imaging'; it is, in short, expecting the Soviets to observe the rule of law and to respect accepted international usages. . . . Unfortunately, Soviets think and react very differently from Americans and West Europeans."

Those hard-core statements open Edgar O'Ballance's *Tracks of the Bear,* a comprehensive study of Soviet imprints in the seventies.

The author is an indefatigable researcher and combines official records and documents with personal interviews, as well as on-the-spot briefings, to put his writings together with the know-how expertise of a life-long journalist. He has authored more than 20 books and innumerable articles for military journals and newspapers. However, his *Tracks of the Bear* is far from the style of a free and easy newspaper story. His book cannot be considered leisure and easy reading.

It takes downright hard work and study to perceive the full impact of his message, but the message is potent for those with a deep desire to understand the doctrine and routine political thinking of the leadership of the Soviet Union.

Beginning the book is Leonid Breshnev's message to the Soviet's 25th Congress, Feb. 24, 1976. "We should remember Lenin's words that in our society everything which serves to build communism is moral. We can paraphrase this by saying that, for us, everything which serves the interest of the people and the building up of communism is democratic."

O'Ballance says of the Soviets, they "are bully boys who need to be taken down a peg or two, who despise and take advantage of good nature and weakness and they have to be dealt with as such. American negotiators must play them at their own game and win; to do so at times may mean taking the gloves off. The Soviets respect only force and the will to use it, as their 'peace strategy' demonstrated in the seventies."

Tracks of the Bear is, if nothing else, thought-provoking and will provide background for a better comprehension of our day-to-day news reports and political bickering.

It proves there are gaps in political philosophies and the gaps are wide, very wide. *—Ralph Dohme*

THE FUTURE OF EUROPEAN ALLIANCE SYSTEMS

Edited by Arlene Idol Broadhurst

Westview Press, Boulder, Colo., 1982. 316 pages. $22.50.

The Future of European Alliance Systems is a collection of distinguished papers first presented in 1981 at an international symposium sponsored by the University of Southern California, the U.S. Army Russian Institute and NATO.

Divided into four sections, the book explores the question of European security from the viewpoints of Eastern and Western Europe, focusing on the shifting attitude toward military defense and delving into the political and economic relationships between Western Europe and the Soviet Union and between Eastern and Western Europe.

Opinions expressed by American, Canadian, British and French authors reflect the growing concern about NATO and its survivability in this day and age when contemporary issues threaten its cohesion. In presenting this argument, the authors not only consider NATO's military and political purposes, but also the impact of forces and events beyond its traditional purview. One of the contributors even goes so far as to imply that NATO's sphere of influence was extended to the Persian Gulf only as an alternate means of justifying its existence.

An entire section is devoted wholly to an analysis of the Warsaw Pact from the perspective of equally dramatic change. Devolution in the Pact, the vulnerabilities and reliability of Eastern Europe as an ally to the Soviet Union, the response of the Soviet Union to recent events of Poland, the economic, political and social dimensions of security in Eastern Europe and the question of integration and interdependency among Pact members are issues which form the framework for an extensive thought-provoking examination.

Like many scholarly works, *The Future of European Alliance Systems* borders on ponderous pedantry. Nonetheless, based on sheer content alone and its relevancy to the current state of affairs within Europe, NATO and the Warsaw Pact, this book will be of great professional value to military and political analysts alike. *—Brian Kilgallen*

A GENERAL'S LIFE

by General of the Army Omar N. Bradley and Clay Blair

Simon and Schuster, New York, 1983. 752 pages. $19.95.

A General's Life brings to public light an Omar N. Bradley that the world has not heard from before. Bradley's autobiography has been called a candid and true account of events and personalities of World War II by commanders who served with him in Europe. It is not only an enjoyable account of Bradley, the man and soldier, but also a unique insight into the leaders who became famous during the battles in North Africa, Sicily and Europe.

During his lifetime, Bradley was reluctant to talk publicly of his true feelings about these leaders, since they were his superiors and he was still a soldier. In this account, which actually amounts to a deathbed testimony, he speaks bluntly and candidly about the events and personalities he witnessed in his more than 69 years of military service. The politics and personality conflicts of such people as Eisenhower, Montgomery and Patton are told. He is also as candid about his own mistakes. Much research is evident as Bradley responds to the memoirs of various public figures and often "corrects" their versions with supporting official documentation.

Co-author Clay Blair's reputation as a methodical and dedicated researcher shows through on every page. His research and Bradley's first-hand knowledge make *A General's Life* one of the most candid and readable books about World War II. In addition to memoirs and previously released documents, the authors also use information from recently released intelligence documents from World War II to present a complete look at the politics, personalities, strategies, successes and failures of a world at war.

While the book pretty much ends with Bradley's "retirement" in 1953, an epilogue brings us up to date on the general's life through his death in 1981.

Vernon Walters, a retired lieutenant general and a former director of the CIA, notes that "The real General Bradley shines from these pages. His penetrating appraisals of men and situations are invaluable to understand the events in which he played so important a part. General Bradley is blunt, direct and often earthly, but he tells how it really was. This book is essential to anyone who wants to know the men and events of World War II and Korea."

A General's Life is must reading not only for historians, but also for anyone who was able to touch history in meetings with the general during his many speaking and social engagements at Fort Bliss, Texas. For those who never met the man or the soldier, *A General's Life* is an excellent way to make his acquaintance. *—Ed Starnes*

BILL MAULDIN'S ARMY

Reprinted by Presidio Press, Novato, Calif., 1983. 384 pages. $12.95 (softbound).

Bill Mauldin's Army is well known to veterans of World War II and generations of cartoon enthusiasts. While Willie and Joe are the central characters, *Bill Mauldin's Army* is more than a reprint of his popular *Up Front*. Dialogue is limited; only the cartoons and their incisive quips tell the story any soldier can understand and appreciate.

Originally published in 1949, the collection of cartoons covers more than World War II combat. It looks at Mauldin's views during his Army "career" which spanned the years 1940 to 1945. One sees Willie and Joe change from clean-shaven recruits to bearded, battle-weary veterans.

Mauldin explains that the development of his characters may be somewhat confusing. "During training, Joe was a smart-assed Choctaw Indian with a hooked nose and Willie was his red-necked straight man. As they matured overseas during the stresses of shot, shell and K-rations, and grew whiskers because shaving water was scarce in mountain foxholes, for some reason Joe seemed to become more of a Willie and Willie more of a Joe."

The complaints and gripes of the ordinary dogface are chronicled in Mauldin's works. The tragedies of war are well annotated, such as when Willie and Joe find wine vats destroyed by retreating German troops. Their feelings are of outrage as they proclaim, "Them rats! Them dirty, cold-blooded, soreheaded,

stinkin' Huns. Them atrocity commitin' skunks. . . ."

Mauldin, who was born on a farm in New Mexico, still calls Santa Fe home. He sold his first cartoon at the age of 9. Since, he has earned two Pulitzer Prizes (his first in 1945 as the youngest person ever to win the award). He now works as a staff editorial cartoonist for the Chicago Sun-Times as he continues to take incisive, one-frame glimpses of the world around us.

Bill Mauldin's Army is worth the effort, even if you've seen the cartoons before. It's an era worth remembering and a spirit worth preserving.

—Ed Starnes

THIS IS THE SAS. A Pictorial History of the Special Air Service Regiment
by Tony Geraghty
Arco Publishing, Inc., New York, 1983. 156 pages. $16.95.

The author makes no claim that this book is a definitive history of the Special Air Service (SAS) Regiment. What he claims is that it is a glimpse of the "flavor" that was and is the SAS. The 400 photographs are not a mere random collection of frozen moments, but have been specially selected to catch that flavor.

Tony Geraghty notes that the SAS has not really changed, only the enemy and the way wars are fought. He paints a picture of a highly trained, highly skilled military machine that answers to the laws of society, even though its enemy is generally a force devoted to violating all the rules of society.

From its beginnings in North Africa in 1941 to its more recent operations in the Falkland Islands, the SAS has proved to be a versatile, special force made up of a special breed of men, a breed of men that has become a legend.

This Is The SAS looks at the changes that have evolved in warfare and the changes that have evolved in countermeasures necessary to combat modern terrorist forces. The photographs depict celebrations of victory, bloodied victims of terrorist attacks and executions, faces of children of the jungles, hidden terrors of jungle warfare, the drudgery of long patrols and the overall weariness of warfare. It is an extremely graphic display and a moving story of the moods of men who face great risks in their "profession."

—Ed Starnes

THE DRAGON'S TEETH? The Creation of U.S. Air Power for World War II.
by Benjamin Kelsey
Smithsonian Institution Press, Washington, D.C., 1983. 148 pages. $15.

Benjamin Kelsey, who served in the Army Air Corps and Air Force from 1929 until his retirement as a brigadier general in 1955, reviews how the hardly viable 1934 U.S. aircraft industry, generating 437 planes, became a vigorously producing industry capable of building 96,318 planes a year 10 years later.

The book gets its title from an ancient Phoenician myth in which Prince Cadmus threw the teeth of a dragon he had slain onto a plowed field and a host of warriors sprang up fully armed. The myth relates to the sudden upsurge in U.S. air power.

Concentrating on the years 1920-1940, Kelsey tells how domestic, social and economic problems established a low priority on air power requirements. Additionally, internal disputes between the Army and Navy as to the proper role of air power added to the antipathy. However, when the time came and air power was needed for World War II, the United States miraculously came from behind and established itself as a major modern air power.

The Dragon's Teeth? will fascinate vintage aircraft historians but will bore the armchair reader.

—Claire Starnes

THE AIRBORNE SOLDIER
by Colonel John Weeks
Sterling Publishing Co., Inc., New York, 1982. 192 pages. $17.95.

This is a story about airborne operations as told by a 30-year veteran of the elite British Parachute Regiment and one of the pioneer free-fallers in that regiment. In *The Airborne Soldier,* COL John Weeks looks at airborne operations from as early as 1803 (balloon operations in France) to small unit operations in today's world. From the early mass formation and glider-borne troops of World War II to Special Forces operations in Vietnam, Weeks talks about the equipment, the people and the times that have changed airborne warfare.

As a relatively new form of warfare, airborne operations have constantly been changing to meet newer and more mobile wars. While the mass drops of World War II will probably never again be seen, Weeks states that "Despite the gloomy prophecies and the effects of continually rising costs, airborne forces are still required and still a potent force in any army."

Thoroughly detailed are the development of the parachute, the planes that deliver the airborne forces, the equipment used by those forces, and the tactics and doctrine employed. An appendix of 71 countries and their airborne capabilities is included.

All in all, the book is interesting reading and provides a valuable insight into airborne operations from the basic levels.

—Ed Starnes

U.S. MILITARY WHEELED VEHICLES
by Fred W. Crimson
Crestline Publishing Co., Inc., Sarasota, Fla., 1983. 472 pages. $34.95.

Compiled by Fred Crimson, a career Army officer and widely recognized military vehicle expert, this book contains more than 2,100 black and white photographs of wheeled vehicles used by the Army, Navy, Air Force, Marine Corps and Coast Guard from pre-1900 to the present. Many of the photographs previously were unpublished. An excellent reference volume.

THE CONTINENTAL ARMY
by Robert K. Wright Jr.
U.S. Army Center of Military History, Washington, D.C., 1983. 457 pages. $15.

The third book in the Army lineage series on the War of American Independence, *The Continental Army* fills a gap in the historiography of the Revolution by exploring in detail how the regular forces were organized and where they fought. The illustrations include many full-color plates. The book is stocked and distributed by the AG Publications Center in Baltimore, Md. It is also available for sale to the public through the U.S. Government Printing Office, Washington, DC 20402.

Opinion

Hawk on the Border

by CPT Bernardo G. Iorio

The United States is losing its war against drug smugglers, a war Air Defense Artillery could help win if it were allowed to use its sophisticated technology to track airborne contrabandists instead of target drones.

The U.S. Drug Enforcement Administration estimates 40 percent of illegal drugs entering this country comes across the Mexican border. A lot of it comes aboard aircraft destined for commercial airports, crop duster landing fields or convenient cow pastures. Air defense units could help hopelessly outmanned U.S. Border Patrol, Customs Service and Drug Enforcement Administration agents erect an effective barrier against drug traffic.

Hawk battalions are particularly suited for anti-smuggling operations because of their organic radar and communications equipment and because target-acquisition personnel are trained to track aircraft flying evasive flight patterns similar to those flown by drug smugglers. Hawk Doppler effect radars are effective against aircraft flying more than 60 mph, masked against terrain features and flying nap-of-the-earth. A Hawk battalion with all its fire units on line could cover 160 to 200 miles of the nearly 2,000-mile long border. Even a few Hawk battalions, shifting from site to site, could make drug smuggling a much riskier occupation.

Civilian agents at the battalion tactical operations center would determine if aircraft, which appear on the Hawk scope, have crossed the border illegally. If the civilian agent determines illegal border-crossing criteria are met, a forward air control officer would request and direct interception by the U.S. Air Force.

The Air Force would scramble an interceptor—probably an A-10—to intercept the encroaching aircraft. The suspect aircraft would be requested to land at the nearest airport. Those which refuse would be followed to their destination where alerted civilian authorities could investigate and, if necessary, make arrests. Some aircraft, when challenged, might return to Mexico, making pursuit impossible. They will, at least, have been denied an illegal entry.

A Hawk unit assigned an anti-smuggling mission would maintain unit integrity. It would be augmented by ground surveillance radars, air-to-ground communications equipment, military police and a motorized reconnaissance platoon. This augmentation would allow the battalion to intercept illegal aliens and contraband moving out of Mexico on the ground as well as arms shipments or stolen property moving out of the United States into Mexico.

The military role would be strictly in support of civilian authority. Each motorized reconnaissance platoon or military police patrol would be assigned civilian agents to handle suspects. Soldiers, therefore, would avoid traffic-cop type confrontations with civilians.

The training of Hawk units assigned border duty would be in accordance with current doctrine and unit standing operating procedures. Additional costs would be justified by increasing the effectiveness of anti-smuggling operations estimated to cost the United States—directly or indirectly—as much as $40 billion a year. The Mexican government would be a major beneficiary because contraband destined for Mexico would be intercepted.

There is a legal basis in the Constitution for this proposal. Article one, section eight, "To provide for calling forth the Militia to execute the Laws of the Union," and article two, section three, "He shall take care that the Laws be faithfully executed," give presidential authority for implementing this type of operation.

There are also historical precedents for committing troops to the border. A review of our national history reveals that federal forces were called upon to enforce the laws of the land on several occasions. President Washington called on troops to enforce tax laws during the Whiskey Rebellion.

The military has already committed aircraft to help counter airborne drug smuggling across the porous southern border, but most of the effort has been concentrated along the Florida coast. The Florida crackdown has increased the drug traffic flowing into other Southern states along the Gulf Coast and the Mexican border.

The proposed plan would require careful coordination between civilian and military authorities at the highest levels. It would also require concessions from landowners, especially along the Texas border where little property is government owned. Troops assigned to the border would have to be careful not to reawaken old animosities which, during some eras of its bloody history, ruled both sides of the Mexican-United States border, but the U.S. military could and should be assigned an active role in patrolling the nation's southern border.

CPT IORIO, *assistant vice president of Western Bank in Truth or Consequences, N.M., is the S-4 of the 3rd Battalion, 200th ADA, New Mexico Army National Guard. He has served as a battery commander, fire coordinating officer, battery executive officer, platoon leader and instructor. Iorio, who also served as an enlisted infantryman from 1959-1963, received his commission in 1966. His first-hand knowledge of drug traffic along the Mexican border comes from volunteer work with the Sierra County Sheriff's Office in New Mexico.*

COMING IN THE FALL ISSUE. . .
ADA IN VIETNAM